COMMON PROPERTY PROTECTED AREAS

by

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Abstract

Garret Hardin's famous article published in 1968 entitled *The Tragedy of the Commons* triggered a heated debate over the capacity of local communities, leading to the development of a new field of research on how shared resources could be depleted, and how collective action could prevent it. This research, however, has not yet been applied fully to broader conservation policy. Protected areas have a particularly close relationship to property rights, to which the knowledge on common property could contribute to a higher degree.

This research aims to integrate them better by proposing a hybrid concept – the *common property protected area* (CPPA). It identifies different characteristics between the two bodies of literature in governance structures, objects of management, values and uses, and stakeholder relationships. Then, this thesis conceptualizes CPPA as a bounded area of land and/or water under legal or other effective common property governance, and managed for both nature conservation and well-being of local people.

The empirical part of the research looks at Costa Rica as a country-level case study with emphasis on policies and examples of forest conservation by government and non-governmental sectors, followed by two site-specific case studies in Costa Rica. One site was a forest reserve owned and managed by a local community for local well-being and conservation values. This case was selected as an example of a CPPA. The other was a forest reserve belonging to an individual owner, which allowed for a comparison with a CPPA.

This research identified key preconditions and promoting factors for grassroots institutions aimed at combining nature conservation and local people's well-being, roughly grouped in four categories: physical and environmental characteristics; social capacity; property rights and roles of various stakeholders; and driving forces. Several preconditions were identified in the studied cases, including clear boundaries, normative values favoring conservation, the well-being of core property owners, and flexibility in the bundles of property rights held by stakeholders.

Keywords: common property; protected areas; grassroots; conservation

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There were several hurdles in my research project. One of them was the language. Doing a doctoral program in a second language was an ambitious challenge. Doing a fieldwork in a third language was even more ambitious. Another hurdle was funding. Finding sources of grant for an international student conducting research in a third country was not easy. In the summer of 2006, I decided to start a full-time job in Japan. This job as a coordinator at a research institute was a great opportunity to learn new things and gain precious experiences, in addition to the much needed income. A trade-off was that my already slow pace of writing became even slower. Writing up the thesis seemed like an impossible mission.

During all these difficult stages, I managed to keep my will. I owe Alex in particular for always being positive and encouraging, while giving critical advice for improvement. I did not give up because he did not. Alex gives suggestions, instead of answers, to make the student reach his/her own answers spontaneously. This requires patience in both sides. A lot more can be learned from this long and winding process, however. I appreciate Alex for this style of supervision that he has maintained.

These hurdles enriched my learning experience. It was adaptive management in practice. The harder a challenge is, the more one can learn from it. This thesis is not the end, but will become the beginning of a more challenging and exciting course of exploration, I hope.

I appreciate Penny Simpson, the university-wide Thesis Assistant, for guiding graduate students in clear and proactive manners. I have learned a lot from Penny’s style, which has been helpful not only in my thesis writing but also in my current work as a research coordinator. Following her advice, this thesis selected the font, line spacing and other formatting arrangements, which would show the document clearly on a computer display while saving the number of pages. In terms of citations, this thesis basically follows the style of the Geographical Review published by the American Geographical Society.

I dedicate this work to John Latham, Patty Hanashiro and my father, who are always in my heart.

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Introduction

Background

A growing body of knowledge has been developed in the literature on common property, demonstrating the capacity of local communities to create institutions enabling sustainable use of natural resources. The literature has also elaborated key concepts in this process largely in response to Hardin's (1968) famous scenario of the tragedy of the commons. For example, two characteristics of the resources subject to the tragedy have been identified in the concept of common-pool resource that: 1) it is difficult or costly to exclude other users; and 2) one person's use subtracts from the resource availability for others (Ostrom and others 1999). Types of property regimes managing the resources have been categorized as government (public), individual (private) and group (common) (Bromley and Cernea 1989; Ostrom and others 1999). It has been clarified that a lack of an effective regime could result in the open access situation leading to the tragedy of resource depletion. One theory posits property as bundles of rights, where various stakeholders have different bundles (Schlager and Ostrom 1992). By developing these conceptual bases and also empirical evidence, the literature on common property has presented an alternative scenario of collective action, in which a community establishes an institution regulating their own usage in order to maintain their undivided rights to use the resource in a long run.

It is worth noting that common property regimes have been studied largely in the context of managing resource extraction. But nature provides other services or values than extraction of specific resources. Protected areas are one policy tool for conservation of such broader values, in which government property regimes restrict other stakeholders' rights to access and use within the bounded areas. Although the necessity of protected areas is hardly deniable, the conventional, exclusion-based model of national parks is infamous in the modern history of protected areas since Yellowstone because such parks as government property regimes have often excluded local communities.

This is where the common property theory and the protected area policy can be linked together. Both look at the rights of stakeholders in specific places. The linkage, however, has not been strong. One reason is the focus of common property research on resource extraction, as mentioned earlier. Another reason also mentioned above is that modern protected areas have been developed mostly as government property. These factors have limited the application of the knowledge on common property to the policy of protected areas. There are, however, other kinds of protected areas that aim for sustainable use rather than strict preservation, and common property regimes might be suitable for the management of such areas. Knowledge developed in the theory of common property, therefore, has the potential to provide more constructive recommendations for improved protected area systems by analyzing property rights in bundles possessed by different stakeholders, for example. This research was undertaken with a motivation to take part in this endeavor.

What motivates grassroots initiatives for conservation?

Key concepts in common property and protected areas are explained in the following two chapters reviewing the literature, but it is worthwhile to explore two topics before going into the main body of the thesis: the values of nature, and ecotourism. I emphasize them because they are

important factors influencing many initiatives at the grassroots level aimed at conservation, as well as the well-being of local people, including the case studies in this research.

Values of nature

A sense of value is one of the forces that motivate an individual or a group of people to make a certain decision. Actions for conservation and development are influenced by values perceived by the stakeholders involved. Therefore, the nature of environmental values at the conceptual level should be considered early in this dissertation.

Harold Lasswell (1977) views values as “the objects of human desire – not tangible, physical objects but conditions of life, whether actually experienced or as yet only aspired to”. Milton Rokeach (1973) describes the concept of value as “an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode” (cited in Kennedy 1985, 122). Hetherington and others (1994, 537) note that “values per se cannot be directly observed, but must be inferred from individual or collective behaviors”. I regard value as a sense of importance that influences action (or inaction).

What about the values of nature more specifically? There are various ways to categorize them. The Millennium Ecosystem Assessment (2005), a worldwide and comprehensive study led by the United Nations, categorizes types of ecosystem services as supporting (nutrient cycling, etc.), provisioning (food, fresh water, etc.), regulating (climate, etc.), and cultural (aesthetic, etc.). These services range from objective functions to subjective experiences by humans. Once perceived by humans, these services become environmental values including both extractive and non-extractive types. The provisioning services defined by the Millennium Ecosystem Assessment are generally linked with human extraction of natural resources. The other services are mostly non-extractive.

With this interpretation in mind, Rolston’s (1988) fourteen “human values carried by natural systems” can also be grouped as extractive (part of economic) and non-extractive values (life support, recreational, scientific, aesthetic, historical, cultural, part of economic, etc.). Kellert’s (1996) nine “basic values of nature” can similarly be divided between extractive (utilitarian) and non-extractive (aesthetic, symbolic, humanistic, etc.). The Science Council of Japan (2001) identifies function-based values of forests as one extractive (production of materials) and seven non-extractive types (conservation of biodiversity, conservation of the global environment, prevention of landslides and conservation of soil, conservation of water sources, regulation of the comfortable environment, contribution to health and recreation, and formation of culture). Dearden’s (1995) “protected area values” as a means of appreciation of nature by humans, and of ecosystem service provision, are basically all non-extractive types. These studies pay greater attention to the philosophical side of values, and therefore subdivide non-extractive values more finely.

Bengston (1994) distinguishes instrumental and intrinsic values, although they are not mutually exclusive. He calls for multi-disciplinary perspectives and methods to understand forest values and dynamics involved. This claim is based on the assumption that values are inherently multi-dimensional, and economic and utilitarian values are only one part of the set of forest values. Kennedy (1985) identifies four systems that are relevant to forest values: environmental/natural resource, social/cultural, economic, and political/legal. Forest values originate only in the social/cultural system, and are expressed by the economic, social and political systems; the environmental system neither generates nor expresses forest values, according to Kennedy (1985), although its interactions with humans affect the origin and expression of values. Daniel (1988) stresses the importance of recognizing both logical and emotional processes of valuing nature.

Brown (1984) explains three realms in values related to human preferences: conceptual, relational and object. A specific level of importance or worth is assigned to each object by humans, with influence from a basic sense of value held in each individual. Rolston (1985) sets out seven "meaning levels" of values including individual and social preferences, market price, organismic, and ecosystemic. The last two of them are supposed to acknowledge values of the natural world beyond human notions. The organismic level looks at each living organism, while the ecosystemic level covers an entire ecosystem comprising diverse organisms. These two levels of meaning form the logical basis for intrinsic values of nature in Rolston's argument, although my view limits values to those perceivable to human minds.

Institutional arrangements aiming for conservation and well-being of local people need to accommodate the diversity of values (Bebbington 2000; Escobar 1996; Zimmerer 2000). Such an integrative approach would improve the representation of interests among people involved in conservation practices. The case studies in this research found an attachment to particular land as well as a farmer's way of life to be influential values, as discussed later in more detail.

Ecotourism

Ecotourism is one of the major incentives for nature conservation, which can also contribute to sustainable community development. It was in fact an important topic in the case studies of this research. It is worthwhile, therefore, to explore the issues surrounding ecotourism here. One of the most frequently quoted definitions reads:

> Ecotourism is environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy, study and appreciate nature (and any accompanying cultural features – both past and present), that promotes conservation, has low negative impacts, and provides for sustainable and beneficially active socio-economic involvement of local populations (Ceballos-Lascurain 1994: 20).

As this definition indicates, ecotourism can motivate people living in natural areas to protect the environment while pursuing socio-economic development of rural areas. There has been considerable debate over the meaning of ecotourism, and scholars have not reached consensus on any single definition. Nevertheless, Donohoe and Needham (2006) identified several key words found in the literature that help define the core concerns of ecotourism: nature-based, conservation, education, sustainability, distribution of benefits, and ethics. Important questions are shifting to more practical ones, such as: Which objectives are emphasized in each case of ecotourism in practice, and how well they are achieved?

Many environmentalists support ecotourism as an alternative option of economic development in rural areas, finding it to be less destructive than extractive industries such as lumber harvesting and mineral mining (Figgis 1993). Ecotourism has increased its share in the rapidly growing market of the entire tourism industry during the past several decades. Ecotourism has been promoted as a means of economic development in developing nations (Hawkins 1994). Latin America, with Costa Rica being the leading example, is no exception in using ecotourism for earning foreign currency, replacing conventional exports of agricultural products and raw materials in some countries (Schlüter 1994).

Whether ecotourism is sustainable or not is much debated, however. Several concepts are helpful in this discussion. First of all, even if a given site becomes a popular ecotourist destination, that does not guarantee a long-term success. There is no apparent reason why typical ecotourism should be an exception to Butler's (1980) classic model of the tourism evolution cycle, which describes a sequence of stages in a tourist destination area growing up to a peak in visitation and declining (or reviving). Second, carrying capacity is relevant to sustainability of tourism. In ecology,

carrying capacity means a “maximal population size of a given species that an area can support without reducing its ability to support the same species in the future” (Daily and Ehrlich 1992, cited in Wight 1998, 77). Carrying capacity in ecotourism can be a total number of tourists that a given destination area can host in a given period of time without exceeding the natural system’s capacity to maintain its form and function. It should also be within a range that can maintain the destination area’s socio-cultural and economic conditions, as well as tourist experience. Quantifiable indicators of such capacity, however, are difficult to establish (Williams and Gill 1994; Wight 1998). Third, in order to avoid a decline in the evolutionary cycle as well as visitation exceeding carrying capacity, the idea of growth management as opposed to “growth machine” has been proposed, in which a wide variety of stakeholders in a destination community take an initiative in identifying the desirable economic, social and environmental conditions of the area, while taking into account the feedback from visitors (Gill 2000; Shikida and Morishige 2001).

In short, appropriate implementation of ecotourism can provide destination communities with opportunities to pursue both environmental conservation and sustainable community development, rediscovering unique values embedded in the natural environment and other local features. Where local groups are responsible for planning and managing tourism operation, the benefits are more likely to remain within the hands of local people, instead of mostly leaking outside (Scheyvens 2007).

Research design

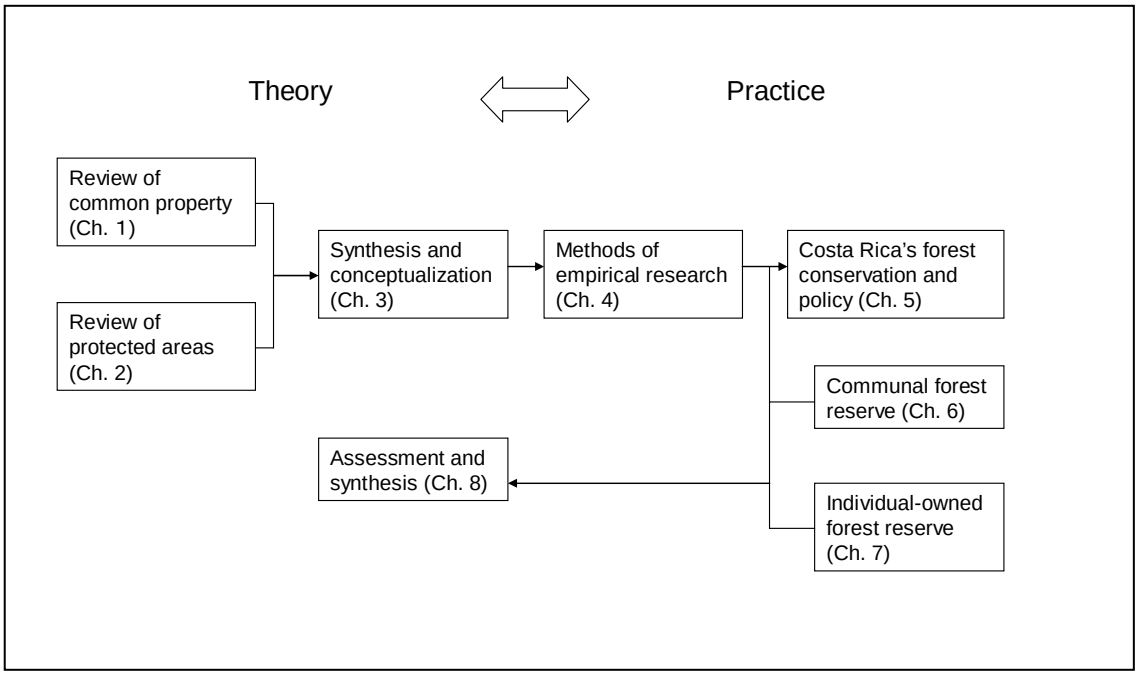
An ultimate objective of this research is to advance our understanding as to how the knowledge established regarding common property can be applied to the place-based conservation policy of protected areas. This is a highly general question, which could be answered only after many studies are conducted in various fields and from diverse perspectives. As part of this effort, this research focuses specifically on the following two questions:

Q1: How can common property and protected areas be better linked together at the conceptual level?

Q2: What are the preconditions and driving forces necessary for grassroots initiatives aimed for conservation and local people’s well-being?

This thesis starts in the theoretical dimension, shifts to the empirical dimension, and finally reconnects the empirical findings back to theory (Figure 1).

Figure 1: Structure of the thesis



The first two chapters following this introduction review two bodies of literature that are most relevant to the conceptualization of CPPA. Chapter 1 traces the history of theoretical development in the literature on common property. Probably the most significant achievement to date is the elaboration of key concepts. The literature has also documented a number of case studies, on which the next task of finding causal mechanisms is underway. The chapter also introduces some of the works written in Japanese, as a modest contribution to overcoming the language barriers.

Chapter 2 provides an overview of protected areas as a spatial approach to conservation. Protected areas play a central role in conservation of biodiversity and other environmental services, although they have often failed in addressing the rights and benefits of local people. Why do protected areas exist? What are their shortcomings? How can they be improved? The chapter summarizes what the literature tells with regard to these questions.

Based on these two review chapters, Chapter 3 compares conventional protected areas with theories of common property, and identifies the differences between the two. The fundamental differences are found in governance (top-down versus grassroots), the types of resources in question (broad versus specific), the kinds of resource use (non-extractive versus extractive), and stakeholder structures (widespread versus specific). The chapter then proposes a hybrid concept of common property protected areas (CPPA), defined as a bounded area of land and/or water under legal or other effective common property governance, and managed for both nature conservation and well-being of local people. In order to infer the conditions needed to support CPPAs, the chapter reviews the conditions identified in various types of institutions and concepts: common-pool resource governance, common property regimes, collective resource management, the commons, protected areas, community natural resource management, resource co-management, and ecosystem management. Chapter 3 attempts to answer the first research question mentioned earlier on the conceptual linkage between common property and protected areas.

Chapter 4 discusses methods and strategies of empirical research. After a brief overview of basic strategies used in social sciences, alternative approaches are introduced, including participatory action research and participatory learning and action. The chapter then explains the actual methods and approaches adopted in the empirical components of this research. The case studies have two levels: 1) Costa Rica as a whole to assess the conditions at the national level; and 2) two site-specific cases in Costa Rica consisting of one CPPA example and one individually (privately) owned and managed property for comparison. Semi-structured and in-depth interviews, participant observation, and document search were used in the fieldwork. Due to the limited number of the cases studied, results of this research are not applicable to all cases of grassroots conservation. Instead of pursuing a high level of generalization, the two site-specific case studies in this research aim to provide detailed contexts. The key to my fieldwork was that I stayed as a volunteer in both sites, which saved time for developing relationships and thus gaining insiders' views.

Chapter 5 examines Costa Rica's national conservation policy with regard to forests in particular. It examines how forest conservation has improved after a period of rapid deforestation during the middle of the twentieth century, and then how conservation has been extended beyond government property. This is a case study at the national level, which also provides background to the two site-specific case studies to follow.

Chapter 6 documents the case of a forest reserve owned and managed collectively by a small rural community in the county of Talamanca, located in the south-eastern coast of Costa Rica. This case examined whether the studied forest area was consistent with the CPPA concept, how the forest was used and managed, and what was driving the initiative of conservation and development.

Chapter 7 documents the case of a forest reserve belonging to an individual owner. This second site, located in the county of San Carlos, was selected in order to make comparison with the case of CPPA. Individual (private) property itself is also an important form of grassroots initiatives, which may support nature conservation and local people's well-being.

Chapter 8 analyzes the findings from the case studies and provides an overall synthesis. The chapter begins by summarizing the two site-specific cases of communal and individual forest reserves in a comparative form. The case of communal forest reserve reported in Chapter 6 confirmed that areas consistent with the concept of CPPA can be found in present-day Costa Rica. Then the preconditions and promoting factors for achieving both conservation and local people's well-being in CPPA as well as individual property are discussed, which are categorized in four clusters: physical/environmental conditions, social conditions, property rights and roles of stakeholders, and driving forces. The chapter also describes a number of stakeholders with varying roles to play.

Overall, this research attempts to advance our understanding about the possibilities of applying common property regimes in boarder conservation policy. The focus of this study is terrestrial rather than marine areas, and the case studies are on forests. Personal and cultural values play an important role in individual and collective decisions when pursuing both nature conservation and local people's well-being. Some preconditions and driving forces are difficult to identify, because they are unique to each place and/or time. By documenting the specific cases, the research bridges between the conceptual model and the practice on the ground.

Chapter 1: Common Property and Natural Resource Management

Introduction

This chapter reviews the literature on common property related to natural resources in roughly four parts. The first part summarizes a history of the field and highlights the achievements. Probably the most important achievement of common property theory is elaboration of key concepts, such as open access, property regimes, bundles of rights, and common-pool resources. Although terminological inconsistency is a topic of debate among common property scholars, conceptualization of resources and institutions in question has contributed to the development of the theory.

The second part of the chapter reviews several works by Japanese scholars, taking advantage of my being a native Japanese speaker. Similar to any other field of study, language is a barrier in cross-cultural communication. The Japanese works have not been widely exposed to readers around the world. This chapter tries to play the role of a bridge between the Japanese authors and the readers in English.

The third part discusses the literature's limited contribution to the understanding of conservation of non-extractive values associated with the natural environment. This trend results from the literature's near-exclusive attention to physical resources with extractive values. Extension of coverage by the literature of common property to the non-extractive values of nature is expected to increase contribution to spatial conservation strategy, especially protected areas.

The fourth and final part discusses the search for systematic causal mechanisms in common property regimes with natural resources. The literature has attempted to identify enabling conditions and factors for sustainable resource management by common property regimes, based on the wealth of single case studies or comparative studies of a small number of cases. The chapter concludes by emphasizing the importance of care and balance in such attempts to avoid excessive simplification overlooking unique contexts.

Development of knowledge on common property

Possibly the earliest major work in the literature of common property is H. Scott Gordon's (1954) article, *The Economic Theory of a Common-Property Resource: The Fishery*. It illustrates the problem of competition in resource exploitation, using the example of fisheries, applying an economic framework, as opposed to the more prevailing biology at the times. However, Garrett Hardin's (1968) article titled *The Tragedy of the Commons* can be singled out as the seminal work that has prompted the development of the literature. With an example of common grassland for grazing, Hardin reiterates Gordon's hypothesis that individual users' incentive to increase their respective gain would lead to depletion of the resource base. A difference between the two authors is that Gordon attempts to elaborate an economic theory of resource (over)exploitation, while Hardin is concerned more about the uncontrolled increase in human population. Countries with greater rates of population growth, according to Hardin's argument, are free riders who consume increasing amounts of food and other resources that exist in limited quantity. When wealthier nations (generally with stable population) assist the economic development of poorer nations (generally with high population growth), according to Hardin's position, it is further helping the free

riders. Thus, conscience is considered to be a self-perishing factor. This point is argued even more explicitly in another controversial article titled *Living on a Lifeboat* (Hardin 1974).

The example of pasture overgrazing leading to tragic resource depletion seems to have caught the greatest attention of the readers. It has provoked heated discussion among scholars from a variety of disciplines such as political science, law, economics, sociology, anthropology, psychology, biology and geography. Ciriacy-Wantrup and Bishop (1975) advance the understanding about common property in the context of resource management. This article explains a number of key ideas, including property as a divisible bundle of rights, the problematic use of the terms *commons* and *common property*, and problems related to fugitive resources, which are discussed later in this chapter. This article also examines traditional institutions in both formal and informal arrangements, and even proposes that the collective self-regulation of resource use can be applied as a solution to contemporary problems. As such, the article succeeds in providing an alternative to the simple argument by Hardin overlooking communal self-management. Ciriacy-Wantrup and Bishop (1975) established the direction in which the emerging field of common property would proceed.

Many scholars engaged in research on common property have challenged Hardin's (1968) tragic scenario. In particular, Hardin's argument that the only solutions would be state property or private property has been critically targeted. Many arguments and examples have been presented to defend the capacity of local communities to manage natural resources in a sustainable way. These critiques see Hardin's scenario as "insightful but incomplete" (Feeny and others 1990, 12); "real, but not inevitable" (Ostrom and others 1999, 281); "a special case...only under certain circumstances" rather than "a broad and accurate generalization" (Dietz and others 2002, 16); and even one that "fails to take into account the self-regulating capabilities of users" demonstrating "the dangers of trying to explain resource use in complex socio-ecological systems with simple deterministic models" (Berkes and others 1989, 92-93). The clearest achievement made in the literature on common property is this refutation of the tragedy of the commons. Hardin in fact later acknowledged the problem and made adjustment, while defending his main argument:

> To judge from the critical literature, the weightiest mistake in my synthesizing paper was the omission of the modifying adjective "unmanaged." In correcting this omission, one can generalize the practical conclusion in this way: "A 'managed commons' describes either socialism or the privatism of free enterprise. Either one may work; either one may fail: 'The devil is in the details.' But with an unmanaged commons, you can forget about the devil: As overuse of resources reduces carrying capacity, ruin is inevitable." With this modification firmly in place, "The Tragedy of the Commons" is well tailored for further interdisciplinary syntheses (Hardin 1998, 683).

It is widely understood today that the *commons* (Hardin 1968), as well as the rephrased term of *unmanaged commons* (Hardin 1998), describes a situation in which no effective institution exists to prevent over-exploitation of the resources.

The literature grew in parallel with organizational development. As common property attracted growing attention in the 1980s, scholars affiliated with the U.S. National Research Council formed a group to conduct research on common property in relation to natural resource management. This group held a conference on common property resource management in 1985 in Annapolis. This was a landmark event in the early development of the field, with a number of papers presented and policies proposed (National Research Council 1986; Bromley and others 1992). The initiative in the U.S. was extended to an international scale, leading to the establishment of the International Association for the Study of Common Property, renamed in 2006 as the International Association

for the Study of the Commons. The Association holds a global conference every other year, supports regional meetings, issues a quarterly publication, maintains an on-line database of relevant publications, and began publishing its own peer-reviewed journal in 2007. The advancement of the knowledge in this interdisciplinary field of common property owes much to the role played by the Association as a focal point.

Numerous publications continue to show the progress of the field. Some of the seminal works have been collected in a book form (e.g. McCay and Acheson 1987; Berkes 1989; Ostrom 1990; Bromley and others 1992). The most recent comprehensive review of the field is found in the book titled *The Drama of the Commons* (Ostrom and others 2002).

A recent trend of the literature on common property is the expansion of the subject. Research on common property now includes such broad topics as “biodiversity, climate change, and other ecosystem services” under the heading of “global commons” (Ostrom and others 1999, 281). The Internet, as well as the information it handles, is also a subject of common property research (Bernbom 2000; Holman 2000). In order to adapt to this broadening trend, the mission statement of the International Association for the Study of the Commons was amended to include “environmental, electronic, and any other type of shared resource that is a commons or a common-pool resource” as the subject of study (Hess 2003, 3; Hess and Meinzen-Dick 2006, 2). The expanding trend, however, does not undermine the importance of more conventional subjects of rural communities and their resource use. Kaimowitz (2004) recommends that the field of common property should maintain its attention on poverty and the impacts of globalized economy in order for this scholarship to be relevant to the pressing issue of conservation and development combined.

As the literature on common property has grown, terms and concepts have been elaborated as part of the theoretical advancement. Clarification of terminology is always an important first step, and it is even more so in an interdisciplinary discourse such as that on common property. The following sections discuss several key concepts in the literature on common property with the focus on natural resource governance.

Key concepts

Open access and three property regimes

This lack of any effective property regime, described by Hardin as unmanaged commons, is called *open access*. In an open access situation, each individual user would be motivated to increase the level of resource use, in order to gain greater individual benefit. This additional benefit goes exclusively to the user, while the cost of the increased use would be shared by all users. Even if the resource is a renewable one, exploitation can exceed the rate of regeneration, possibly leading to total depletion. In the long run, therefore, it is possible that all users bear the ultimate cost of overuse.

Other than open access, the literature has a general agreement on three property regimes: state property, common property and private property (Berkes and others 1989; Bromley and Cernea 1989). As mentioned earlier, open access means a situation without any of the three property regimes, where resources are free for all. Ostrom and others (1999) adopt different terms to describe the same regimes: *government property* for state property, *group property* for common property, and *individual property* for private property. This alternative classification by Ostrom and others reduces ambiguity effectively. For example, *state* can mean a national government as well as a subsidiary unit of a nation in the federal system (e.g. the State of California). By using the word

government, as well as specifying the level of government where appropriate, the risk of misunderstanding is reduced.

Common property can also be ambiguous. It can be understood as private property shared by a group. McKean (2000, 37) describes it as a "combination of individually parceled rights to flow and shared rights to an intact stock" of resources. It can also mean a collective ownership by a group of geographically dispersed members, an example of which is a land trust. In the present thesis I favor the use of *group property* to mean collective ownership in general, while I also maintain the use of common property as one type of group property. Only where the group is situated within a local community does this dissertation describe it as common property. This will facilitate distinction of community-based regimes from other types of group property; an example of the latter is corporate ownership.

Resources can be managed in overlapping, complementing or conflicting property regimes. A complementary combination of regimes may be more effective than a single regime, although conflicting regimes can invite disputes and mismanagement of resources (Berkes and others 1989; Schlager and Ostrom 1992). When leading the university tutorials, I have found it effective to let the students discuss the property regimes of academic resources such as the books in the library. Some students say the books are government property in the sense that the government provides funding for their purchase. Others suggest the books are individual property because the books belong exclusively to the single academic institution. Yet others propose the books to be group property because specific members of the institution share the books. All these positions are in fact correct, showing that property regimes in the real world are often complex and overlapping. Property rights are “a complex bundle of overlapping and hierarchical rights and claims, distributed among many persons and related to other social relationships” (Jeanrenaud 1999, 129). They are also dynamic rather than static. Many traditional institutions defining the property rights over the natural resources have been destroyed due to power contestation within local communities, or between communities and outside parties such as the government and conservation-oriented organizations (Jeanrenaud 1999).

Another question is who constitutes a community. The literature of common property appears to have focused more on community of place than community of interest. Agrawal and Gibson (1999), however, question the typical image of community as a homogeneous social structure in a small spatial unit sharing norms, and recommend a focus on institutional mechanisms in order to understand multiple interests and actors in a community. McCay (2001) also warns of the tendency for researchers to romanticize common property, because the community-based approach is not necessarily a perfect, or even adequate, solution to market failure; c*ommunity failure* may occur as easily as market failure in resource management. One such failing example is a Canadian case of community-based resource management documented by Bradshaw (2003), in which the community decisions are dominated by non-permanent residents who overpower the voices of aboriginal people with much longer-term interests. Thus, a local community should be regarded as a dynamic and internally diverse unit, in which different interests interact and sometimes challenge each other.

Hardin's (1968) scenario of the tragedy is partly based on the game theory, especially the prisoner’s dilemma (Ostrom 1990; Ostrom and others 1994). Individual resource users are assumedly driven to maximize their benefit without having to pay the full cost. This is a rational decision for each user, but ultimately there is no winner and everyone suffers. Many scholars of common property, on the other hand, have offered examples of self-regulating institutions for collective use of natural resources. This counterargument attempts to prove that collectively rational decisions and actions are possible. In fact, it affirms the point made by Hardin (1968, 1247)

that “mutual coercion, mutually agreed upon by the majority of the people affected” is necessary in order to prevent free riders from thriving. The difference of the counterargument from Hardin’s thesis is that it stresses the capability of communities, not the efficacy of privatization.

Property and a bundle of rights

Property is a subject of studies in various areas such as law and urban geography. In the urban context, property is typically treated as a matter of ownership of rights and things, and the emphasis is on private property with clear spatial boundaries (Blomley 2004a; 2004b). There are many types of “things” covered in the concept of property, including bounded spaces of land and water, natural resources, buildings and ideas. Property often means the rights over these things. However, the dual meaning of property as both rights and things makes the concept ambiguous at times. This thesis uses the term property to refer principally to rights over things, but not to the things themselves, in order to avoid confusion.

Another interesting finding about urban property is that boundaries often are not as clear and determinant as they seem; fuzzy transition and interaction across boundaries occur normally (Blomley 2004a). This might be even more so with rural and wilderness boundaries, because property boundaries are largely human artifacts. An implication of this understanding for resource conservation lies in the idea of coordinating conservation initiatives across the boundaries. An example is creation of buffer zones between core protected areas and surrounding areas. In order to have ecological integrity in a broad landscape, coordination beyond property boundaries is necessary. Maya Biosphere Reserve in Guatemala is an example of disintegration, where different NGO-led projects brought their own approaches to reforestation on respective sites, resulting in patchwork-like landscapes (Sundberg 1998). This case also shows that landscape integrity is not a given, even though there was a generally shared goal of resource conservation across boundaries.

There is a difference between urban and rural contexts of common property. Blomley (2004b) argues that common property is rare or even non-existent in the urban context. In the rural context, on the other hand, resource management by common property is documented with many real cases, even in today’s world.

What constitutes property over natural resources? Literature on common property has regarded property rights as an important part of institutions governing natural resources (Feeny and others 1990). Schlager and Ostrom (1992) classified property rights concerning natural resources into five types of authority: access, withdrawal, management, exclusion and alienation. Definitions of these rights are shown in Table 1.

Table 1: Typology of property rights

Access	The right to enter a bounded space
Withdrawal	The right to extract a natural resource
Management	The right to regulate internal use patterns and transform the resource by making improvements
Exclusion	The right to determine who will have access, and how that right may be transferred
Alienation	The right to sell or lease either or both of the collective choice rights of management and exclusion

Source: Adapted from Schlager and Ostrom (1992)

Schlager and Ostrom (1992) then categorized groups of people involved in natural resource institutions: *authorized users* with access and withdrawal only; *claimants* with access, withdrawal and management; *proprietors* with access, withdrawal, management and exclusion; and *owners* with access, withdrawal, management, exclusion and alienation. Though not implicit in the categorization by Schlager and Ostrom, these rights are assumed to involve varied degrees of rule enforcement. For example, owners and proprietors may enforce the internal rules of use, as well as physical exclusion of outsiders, while authorized users may have to depend on another party such as the owners and the government to execute such actions. The framework by Schlager and Ostrom (1992) is useful in understanding varying bundles of rights held by different stakeholders, although it is not the only way of classification.

Another distinction of property rights can be made between *de jure* and *de facto* property rights (Feeny and others 1990; Schlager and Ostrom 1992). De jure property rights are ones with external legal recognition. Enforcement of such legal arrangements assists property holders when defending their rights against those without such formal rights. De facto property rights are normally formed internally within user groups, and these rights may differ from the applicable de jure rights. De facto arrangements have not been paid attention as much as they should, according to Schlager and Ostrom (1992). One of the reasons is that, in de facto institutions like traditional common property regimes, the cost of management, especially monitoring the compliance of user rules, is often internalized within the user group.

This argument is particularly relevant to protected areas. Costs of enforcement, monitoring and sanction are largely external to the economic framework of many public protected areas. In other words, governments have to allocate their budget to cover these costs, while park visitors are not paying the full costs. Where public budget comes from general tax revenue, the burden is passed to the general public, a majority of which may receive no direct benefits from the protected areas. When there are other higher priorities on the political agenda, government budgets for conservation are often too low to pay for the management costs. If these costs are shared and paid by the park visitors, or internalized by mutual monitoring and sanctioning, it may serve as a fair and highly efficient mechanism.

Some scholars of common property, therefore, consider the transition of community-managed lands and resources to public protected areas as a possible path to degrading both resources and user welfare, particularly due to insufficient monitoring; “de facto common property with some limitations on access and use patterns became de jure government property – but due to the lack of enforcement, it frequently became de facto open access” (Dietz and others 2002, 13). Well designed and enforced common property would have mechanisms of self-regulation, monitoring and sanctioning, which could be more efficient and effective in achieving environmental as well as social goals than the so-called paper parks with little or no rule enforcement.

Common-pool resources

In addition to the human dimension of property regimes, the nature of resources in question must be considered. Bromley (1992) insists that no resource has an inherent property regime, and that the resources per se and their property regimes must be distinguished clearly from one another. Bromley, therefore, rejects the term *common property resource*, which has been in use among the scholars of common property, as potentially misleading. For example, the article by Gordon (1954) and the book edited by Berkes (1989), both of which are considered seminal works, contain *common property resource(s)* in their titles. This term would have been used far more frequently, if Bromley had not criticized it. As a response to the critique of the use of *common property resource*, the term *common-pool resource* was coined and has been used widely to specify a resource with

two characteristics: 1) exclusion from the resource is costly (difficulty of exclusion) and 2) one person's use subtracts from what is available to others (subtractability) (Ostrom and others 1999; Dietz and others 2002).

It is important to keep in mind that the boundaries set by humans often do not match the natural processes. Giordano (2003) illustrates the problems of common-pool resources from a geographer's perspective, distinguishing between *resource domain* and *rights domain*. A resource domain is formed by physical and environmental boundaries, such as a watershed, a bounded forest and a wildlife habitat. A rights domain on the other hand defines spatial boundaries of human intervention. Where a rights domain and a resource domain coincide, the property holder(s) would have exclusive rights over the resource relatively easily. Examples of this situation are a lake that is government property, and an estuary delta that is individual property clearly delineated by water streams from surrounding lands. Complexities arise from the varying ways in which the two domains intersect. Particularly problematic are fugitive and migratory resources. Fugitive resources move in one direction and do not return, an example of which is water in a non-tidal river. Migratory resources move back and forth cyclically, or in random directions. Migratory birds, fish and animals are example of migratory resources.

Debate on terminological consistency

Despite the elaboration of the key concepts, some still question the consistency in the use of the important terms. The fundamental problem is that terms and concepts are sometimes used without a clear definition (Bromley 1992; 2003). The problem of inconsistency results partly from the interdisciplinary nature of the field. Nevertheless, it is a major hindrance to theoretical development in the common property scholarship, according to Poteete (2004).

One example is *the commons*, a frequently used term in this body of literature since Hardin (1968). The problem is that the commons can mean specific physical resources as well as the property arrangements that govern those resources. Ambiguity of the word commons initially led to the use of two terms: *common property* for an institution, and *common-pool resource* for a resource. A recent trend is a return to the term commons. The former International Association for the Study of Common Property is now International Association for the Study of the Commons, as mentioned earlier. The association's publications are titled *The Commons Digest* (formerly the *Common Property Resource Digest*) and *The International Journal of the Commons*. Inoue (2001) welcomes inclusive discussion on the commons with diverse meanings, but each usage should have clarity about what it means. In this thesis I avoid using *the commons*, except when referring to the works and knowledge built under that heading.

As a response to the claim by Poteete (2004) on inconsistent vocabulary in the literature, Jesse Ribot argues that the clarity with internal consistency by each narrator is important, rather than consensus among all narrators. Ribot claims "the definitions that people adopt, like theories, are a function of interest" (Ribot 2004, 4). This realization can be extended to critical analysis of how and why different actors mean different things by a same word, because "[w]ords are mighty two edged swords... [that] can be used to clarify and obscure" (Ribot 2004, 5). Another response by Robin Roth (2004) emphasizes the importance of cultural, linguistic and political contexts, showing how differently *nature* and *conservation* in Northern Thailand are interpreted by government officials, rural Karen farmers and outsiders. Taking this inevitable diversity in perception and expression into account, Roth warns that "conceptual consistency…to determine fixed definitions for terms and concepts…seeks to remove the context within which the term is being used", and it is even "dangerous and potentially harmful" (Roth 2004, 5). Definitional diversity, therefore, is not only

inevitable in the research on common property, but also useful as a means of expression leading to theoretical advancement, as long as the meanings and contexts are clearly explained.

Definitions of the commons and common-pool resources may become more complex as these terms are used in increasingly diverse ways. For example, Ostrom and others (1999) regard fresh water in an international basin, large marine ecosystems and global climate as examples of common-pool resources beyond the local, regional and even national scales, describing them as *global commons*. Although their call for diverse institutions is rational, the article appears to lack terminological clarity. Such terms as the global commons should be used with a clear definition. Regarding the climate as a resource might also be problematic, if no clear explanation is provided. Another example is the following passage:

> Typically, successful decentralization of resource management results in the creation of *new commons* as central governments delegate rights and powers to new actors who can make decisions about the disposition of these resources. The creation of *new commons* is an important development in natural resource policies worldwide (Agrawal and Ostrom 2001, 488-489, emphasis added).

The authors of the above article use *new commons* without a clear definition, as if it were already a widely accepted concept. Local institutions for governing the natural resources as a result of the devolution of authority from the central government are not a new or rare phenomenon. It would be more appropriate to describe it without an ambiguous term like *new commons*. Clear definition should be provided at least, if such terms are used.

The above review is based on the literature in English. In the following section, I review some of the major works in the Japanese literature, which has not received sufficient attention due to the language barrier. The Japanese literature has found lessons on the local communities' capabilities for managing natural resources sustainably, similar to the Western theory, although the Japanese scholars' motivations were not necessarily the same as those for the Western.

The Japanese literature: differences and similarities

Japanese scholars have studied common property in such disciplines as sociology, economics and anthropology. However, just as in any field of studies, language has been an inevitable barrier in the literature on common property against efforts to share knowledge worldwide. Much research in environmental sociology has been conducted on common property. Because the outputs are mostly written in Japanese, however, the presence of the Japanese scholarship is limited in the world (Hasegawa 2006). Translation is not always available for important works. Even if translation is available, communication of exact meanings and contexts becomes less easy because of the historically and culturally unique backgrounds of respective languages.

Important examples of traditional regimes based on common property over land and natural resources in Japan have not been shared sufficiently in the world. It is Margaret McKean (1992), a scholar from the United States, who reported these Japanese cases to the international audience in English. Research by Japanese scholars does not appear to be as widely read, nor as influential as it could be in the international arena of common property discourse. This chapter places some of the works written by Japanese scholars within the debate over common property.

While Hardin (1968) was the catalyst for the development of common property as a field of research, Japanese scholars had a different motivation. Witnessing pollution and environmental degradation in the process of modernization, the Japanese scholars were reminded of the importance of collective and small-scale institutions emerging at the local level; field-based

research was conducted to examine the process of and the reaction to Japan's industrialization (Murota and others 2003).

The history of property regimes in Japan can be summarized as follows. Ancient hunters and gatherers had all resources as open access. As farming began, people moved to flat lands to cultivate and obtained resources such as grass as fertilizer from surrounding hills. Common property regimes existed already around the eighth century, and kept spreading widely. These old common regimes had two dimensions: one for a village as internal rules, and the other for two or more villages as boundary rules. The Edo era, from the seventeenth century to the middle of the nineteenth century, was the most active time in Japan for the formalization of common property regimes (Mitsui 1997). A typical institution in this practice was called *iriai*, with which a specified group of local residents governed their use and management of mountains, rivers and other shared spaces (Murota and Mitsumata 2004). Many *iriai* forests had their function of providing nearby residents with fuels and foods until the middle of the twentieth century. In the northern Japan, the indigenous people of *ainu* also had a social system based on a community unit called *kotan*, which regulated members' behavior including resource use in forests (hunting and gathering), rivers and the sea (fishing), with the strong power of the leader (Mitsumata and Murota 2005). The central activity of common property regimes over natural resources in the mainland of Japan was farming of crops, with rice being the most important. This is a difference from England and Wales, for example, where pasture was the main activity and motivation for forming common property regimes (Mitsumata and Murota 2005).

During the Meiji era starting in 1868 following the Edo era, however, land reform established new cities, towns and villages. In this process, communal spaces were registered as government property to facilitate taxation. These Meiji policies of modernization replaced, and largely destroyed, the traditional institutions for sustainable resource management, although strenuous resistance by traditional users in some areas successfully maintained their rights of collective management over lands and resources. Privatization of property rights also proceeded as the national government sold its forest lands to major business owners (Murota and Mitsumata 2004). This further discouraged the maintenance of traditional common property.

The shift from common property to either government or individual property continued into the twentieth century and was accelerated in the 1960s when the Japanese economy grew rapidly. Labor force moved from the primary to secondary sector, from rural to urban places. Chemical fertilizer was used, and energy was obtained from fossil fuels. All these changes contributed to the decline of common property regimes over iriai forests (Mitsui 1997). The most recent trend is that new types of common property like land trusts began to emerge in Japan in the 1970s, with environmental movements helping rediscover multi-dimensional values of nature (Mitsui 1997). It is also worth noting that more than a few local communities resisted the government intervention, and succeeded in maintaining their effective control over the rules of resource use. In the present times, there are over two thousand sites of such de facto common property forests, totaling almost 300 thousand hectares (Mitsumata and Murota 2005). The rise and fall experienced by the common property regimes in Japan can be understood as the history of struggle between traditional and modern governance.

Based on the empirical lessons from his own research in Indonesia, Inoue (2001) proposes the concept of *tight local commons*, which is characterized by clearly defined geographical boundaries and tight control by members. A tight local commons is distinguished from a resource or institution covering a wide range of space, such as the ocean. Even where a resource and institution in question are present only in a limited geographical scale, careful management needs to exist for inclusion in Inoue's category of tight local commons. Traditional institutions in a small

geographical scale, in which groups of face-to-face interactions between specific members manage resources with strict rules, are becoming scarce. From a sociologist's perspective, Miyauchi (2001) explains three possible situations in which common property regimes collapse. First, the life and livelihood of local people is disconnected from with the surrounding natural environment. Second, ownership and/or management authority is transferred to governments or individuals, and away from community organizations. And third, the local community loses its internal unity as the necessity to work together in resource use decreases.

Anthropologist Tomoya Akimichi has conducted field-based research to ultimately tackle a single question: who owns nature? Ownership, occupation, enclosure, or any other claim of right over natural resources occurs as a process of "culturalization of nature" by humans (Akimichi 1999, 12-3). Property rights established that way, however, are not necessarily static. Distribution of resources and even land rights can change in a seasonal cycle, between pre-harvest and post-harvest periods. For example, resources taken from forests as fertilizers might be managed collectively under strict rules by specific users only until harvest of crops, while they are open to others during non-harvesting seasons. In addition to temporal variation, Akimichi also emphasizes spatial and ecological factors; management should be based on ecological continuity, rather than human-induced boundaries. Mangrove forests, for example, straddle land and water. Management of such resources in ecologically transitional habitats should represent multiple, not single, interests of society (Akimichi 2004; Tanaka 1999).

To summarize, the Japanese literature has accumulated knowledge that has not been sufficiently communicated beyond the boundaries of languages. Major findings do not contradict those of the Western literature. Arguments by Tabeta (1990) explain these shared findings well: the Japanese modernization from the nineteenth century was largely a process of changing common property into government or individual property; government property meant aggregation of individual property; traditional theories of economics based on the market economy do not take into account the externalities like environmental degradation; application of the hypotheses from market-based economic theories falters; and local communities with trust, labor and ownership would be the key solution. The decline of traditional regimes with common property occurred in Japan as the government intended to make land and property arrangement simple and legible, presenting a clear example of state control described by Scott (1998). The eco-commons argument (Akimichi 2004) is also a concrete example of interaction between resource and rights domains explained by Giordano (2003).

Concentrated attention on extractive use of resources

Common property studies have focused mostly on specific resources, such as lumber, fish and irrigated water. The bundle of property rights conceptualized by Schlager and Ostrom (1992), for example, places "withdrawal" of the "products" of a resource as the second most basic right after access. These are extractive uses of particular elements in nature. But nature has other values and services, such as aesthetic beauty and purification of air and water. Common property studies have touched upon the natural *environment* and its non-extractive values only as the background or outcome of the ways in which natural *resources* are used. Such reference is usually implicit, and the dominant focus is on particular resources for extractive use (Kitamura and Clapp 2004).

One policy tool for protecting non-extractive values of nature is to manage areas of high values as protected areas. National parks and other publicly protected areas are government property. Government property regimes, however, do not always guarantee effective protection of non-extractive values of nature. In fact, Hardin (1968) mentions excessively visited national parks as another example of the tragedy:

> The National Parks present another instance of the working out of the tragedy of the commons. At present, they are open to all, without limit…The values that visitors seek in the parks are steadily eroded. Plainly, we must soon cease to treat the parks as commons or they will be of no value to anyone. What shall we do? We have several options. We might sell them off as private property. We might keep them as public property, but allocate the right to enter them… These, I think, are all the reasonable possibilities. They are all objectionable. But we must choose—or acquiesce in the destruction of the commons that we call our National Parks." (Hardin 1968, 1245)

Where de jure government property of a national park fails to avoid depletion of common-pool resources that the park was supposed to protect, as a result of an overuse, it can be described as de facto open access. Hardin suggests two possible solutions. One is a total shift to individual property, and the other is to maintain government property while providing selected individuals with a limited bundle of rights. Selection of authorized entrants could be done on a first-come-first-served basis, or by a draw, or a fee set high enough to function as a screening process. Either way, the purpose is to keep the number in a desirable range. Common property is not mentioned by Hardin as a possible solution.

Unsatisfied with these limited options, common property scholars have proposed communal institutions as an alternative solution for extractive resources like local fisheries, but not in the context of parks and protected areas. When common property scholars discuss parks and protected areas, the purpose can be unsuccessful cases of decentralization and resource conservation under government property (Agrawal and Ostrom 1999; 2001).

The literature on common property has been effective in criticizing protected areas, but relatively poor in answering the fundamental question about nature conservation. Must we abandon all protected areas because they are so problematic? And what would happen to the values and functions of those areas? There has been no plausible alternative proposed to date to substitute for protected areas, even in the most critical literature. Here is the challenge: we need protected areas, but we must also address the needs of local communities.

This dilemma leads to the claim that literature on common property has not executed sufficient influence on policy makers of protected area policy. Murphree (2002) suggested that the World Parks Congress in 2003 would be a good opportunity for the scholarship of common property to contribute to the protected area policy dialogue. Though the World Parks Congress is over, the message is still valid. Knowledge accumulated in the literature on common property has the potential to provide more constructive recommendations for improved protected area systems by analyzing property rights in bundles possessed by different stakeholders, for example.

Search for causal mechanisms

One major purpose of the Annapolis conference in 1985 was to share the lessons from various research projects conducted in a single framework. The framework, initially called a model at the time of the Annapolis conference (Oakerson 1986), places physical attributes and technology and decision-making arrangements as the initial causes that would determine the patterns of interaction (between people and resources) leading to the outcomes (state of the resources and institutions). In a longer term, physical attributes and technology as well as decision-making arrangements may change partly because of the patterns of interaction and previous outcomes, hence the creation of a dynamic framework with backward arrows between the variables (Oakerson 1992).

Dolsak and Ostrom (2003) present a similar framework, starting with four baseline variables: economic environment, political environment, legal environment and technology. Along with these

four are resource characteristics and characteristics of users (individual and group), the latter of which is affected by economic environment and also influences political environment. All these variables contribute to forming institutions governing resource use. The final variable in the framework is resource use, which is the outcome of institutions governing resource use but also affected directly by technology. Dietz and others (2003) illustrate how the general principles for robust governance of environmental resources can be applied to the governance requirements. In this framework, each of the eight design principles identified by Ostrom (1990) is connected to two or more of the five requirements: information provision, conflict management, rule compliance, infrastructure, and adaptation.

The literature on common property has in fact documented a wealth of case studies, such as Netting (1976), McKean (1992) and Agrawal (1994). Comparative or meta-analysis across the broad range of case studies accumulated over the years has always been on the agenda of the field. Efforts have been made to identify causal mechanisms by comparing the case studies accumulated over the years. Some cases show more robust institutions to govern natural resources collectively than others. A simple question been asked for a long time is: what makes common property institutions emerge, evolve and sustain resource use within the natural capacity of regeneration? Research has identified several characteristics including clear boundaries, small group size, and internal monitoring and sanction mechanisms (Ostrom 1990; McKean 2000; Agrawal 2002).

Search in the literature on common property for generalized causal mechanisms continues (Stern and others 2002). This effort is a challenge against the perception that descriptive case studies are non-scientific (Sato 2003). One way to overcome this problem is to analyze different cases comparatively, which would support the process of generalizing the findings. Each case study should provide clear description and rich context showing important information such as the methods of case selection, data collection and analysis, and how the case relates to theory. This facilitates assessment of what is common and what is unique in different cases, making comparative analysis easier and more effective (Sato 2003).

Interpretation of the findings is influenced by the stakes and values held by those engaged in research (Conley and Moote 2003). Comparing different cases that represent different interests and objectives is difficult. Therefore, the task of generalizing causal relationships into theory must be attempted with great care. Particularly where interventions are in place, such as a regulatory policy and a development aid project, a close examination of how the current conditions came to be is important. Adjustment of local structures to a universal model may not always succeed. Torigoe (1997: 21-22) cautions that “behavior is merely a phenomenon that happens to be chosen out of several options”; careless analysis is tied with “a danger of trying to complete the task just by drawing ridiculously neat diagrams”. People do not always act as the general theory predicts. Deciding factors are not necessarily in the diagrams of causal mechanisms. Finding common factors is important, but maintaining attention on unique factors at the local and even personal level is also necessary for researchers conducting case studies.

Conclusions

The literature on common property has achieved significant development during the past several decades. It has challenged Hardin's scenario about the tragedy of the commons in a persuasive manner. Theory has advanced in this process with clearer terminology, including open access, property regimes, common-pool resource and collective action. There is an on-going debate, however, regarding the inconsistent use of concepts among the writers from different disciplines. Diverse ways of conceptualization should be welcomed as a beneficial means of

discourse. However, this chapter argues that the use of ambiguous terms such as the *commons* can and should be avoided as much as possible. They can be replaced easily by such terms as common-pool resources and common property institutions.

This body of literature is no exception in terms of barriers in communication across different languages. Taking advantage of my being a native Japanese speaker, I have reviewed some of the major works in Japanese in this chapter. Japanese scholars in sociology, anthropology and economics, among others, have developed the theory. This process has not necessarily been tied strongly with the Western literature's theoretical development, but has occurred during the same period with similar outcomes. The Japanese literature also documents the cases of locally tight institutions regulating the use of natural resources collectively, although such institutions have been largely lost in the process of modernization.

Common property research has made limited contributions to protected area policy, largely because it has focused primarily on the extractive uses of natural resources. Application of common property theory to the non-extractive uses and values of nature is possible. This integration would help diversify the protected area institutions beyond exclusionary and top-down models of government property regimes.

Finally, scholars engaged in common property have documented a wealth of case studies, and they continue their efforts to produce a systematic synthesis of causal mechanisms in common property institutions. While identification of key criteria and their cause-effect relationships is considered an important step in the advancement of theory, a careful and balanced approach is necessary. Oversimplification of the mechanisms might overlook hidden but important factors. Depth of case studies, therefore, remains important in attempts to generalize the findings. Addressing these challenges would help strengthening the theory of common property further.

Chapter 2: Protected Areas as a Spatial Approach to Nature Conservation

Introduction

This chapter reviews protected areas as an approach to nature conservation. Along with the preceding chapter, it frames the conceptual basis of the present research. Protected areas are a policy instrument to protect a variety of benefits that nature provides. The Millennium Ecosystem Assessment refers to these benefits as ecosystem services, which include four categories: 1) provisioning services such as food and water; 2) regulating services such as regulation of floods, drought, land degradation, and disease; 3) supporting services such as soil formation and nutrient cycling; and 4) cultural services such as recreational, spiritual, religious and other nonmaterial benefits (Hassan and others 2005, 27). Protected areas have grown around the world in both number and area (Coad and others 2009), although there are various views as to whether protected areas are functioning as they are supposed to (Bruner and others 2001; Chape and others 2005).

This chapter first provides an overview of protected areas in terms of their origin, definitions, categories and governing bodies, highlighting recent revisions to the definition and categories as an ongoing effort to coordinate protected areas globally (Dudley 2008). It then reviews several seminal reports to examine how they viewed the significance and role of protected areas for nature conservation. The chapter then discusses four particular issues, in which difficulties faced by protected areas and possible ways of mitigating them are described: 1) ecosystem protection, 2) human-nature relationships, 3) distribution of benefits and costs, and 4) assessment of effectiveness.

What are protected areas?

There is a long history of what are now called protected areas. Evidence exists that areas were chosen and enclosed in the Mesolithic times to protect objects with sacred meanings (Henneberger 1998). Hunting reserves for royal families in Europe, for example, can also be regarded as centuries-old protected areas (Zupancic-Vicar 1997). A widely shared understanding is that protected areas of the modern style began in the late nineteenth century, when the world's first national park was established in Yellowstone in 1872.

Broadly speaking, policy can be implemented by a number of means, including laws, regulations, taxes, fines or charges, subsidies, budget allocation, and information dissemination (Bardach 2000). One major approach to conservation is to draw boundaries on lands and waters, and regulate the use of those bounded areas by legal means. This is the basic principle of protected areas as a policy. If prioritized over other policy priorities, the government may allocate a larger amount of budget, manpower and other resources to protected areas, and strengthen education and public relations on the significance of protection in the designated areas.

Today, protected areas are one important form of policy aimed at conservation of the natural environment. The two terms, *park* and *protected area*, are often used interchangeably, a common practice that this dissertation follows hereafter. Other categories like nature/forest reserves and wildlife refuges are examples of a wide variety of names given to protected areas, and the wide range of purposes for which they are adopted.

There are various definitions of protected areas. Instead of listing many versions, two definitions can be introduced here, which are important and reasonable in my view. One is the definition in an influential document titled the *Global Biodiversity Strategy*: “a legally established land or water area under either public or private ownership that is regarded and managed to achieve specific conservation objectives” (WRI, IUCN and UNEP 1992, 230). The other is a version used by the IUCN: “a clearly defined geographical space, recognized, dedicated and managed through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley 2008, 8). Neither of these definitions limits protected areas to those owned by governments. This opens the door for diverse forms of protected area governance, which I discuss later in more detail.

The above definition by IUCN is a revision of its predecessor which reads: “an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means” (IUCN 1994, 7). The 2008 definition repeats one phrase of the 1994 version exactly, “through legal or other effective means” but rephrases other parts in order to be more comprehensive and precise. The 2008 guidelines of IUCN appear to me as a significant improvement from its predecessor in terms of format and description, designed to facilitate clear understanding and application by policy makers and practitioners.

There are two main differences between the 1994 and 2008 guidelines by IUCN, according to Dudley (2009). First, the new definition states “nature” as the object of protection, which is broader than “biological diversity.” This is a shift back from the strong emphasis on biodiversity in conservation policy in the 1990s and 2000s, taking into account climate regulation and other services provided by nature more generally. Second, the new guidelines stress the importance of results rather than intentions. The word “achieve” is used in the new version, because designation of protected areas should not be an end but a means to the goal of conservation. Both of these two main changes appear timely and reasonable.

The IUCN guidelines define not only protected areas in general but their categories. The 2008 categories follow the basic structure of the 1994 version, although the 2008 version adopts some changes and provides much more concrete description of each category as well as relationships between categories. Category V (protected landscape/seascape) and Category VI (protected area with sustainable use of natural resource) remain the subject of debate among scholars and practitioners (e.g. Borrini-Feyerabend and others 2004; Locke and Dearden 2005). Both categories are concerned with cultural landscapes characterized by human-nature interaction, while Category V endures long-term, intensive resource uses such as agriculture and forestry that might result in more human transformation of nature than Category VI (Dudley 2008).

The relative naturalness of the IUCN categories is expressed as: Ia = Ib > II > III > IV > = VI > V (Dudley 2008). This order is not necessarily consistent with reality, however. A study by Leroux and others (2010) finds that Category VI is more natural than anticipated; Category Ia (strict nature reserve) may be less natural than supposed to be; large intact protected areas are almost non-existent; and Category VI has good potential for conservation. These authors conclude that there is a mismatch between the assumptions based on the IUCN categories and the real situations. The mismatch occurs because there is no standard way of distinguishing the categories clearly. Each government classifies its sites by its own judgment. Sites with similar characteristics in different countries may end up in different IUCN categories. The mismatch appears unavoidable because the IUCN classification is not perfect, and there is no perfect one anyway. Refinement and consistent application of categories would be attempted as a never-ending task for the practical purpose of accuracy in inventorying. At the theoretical level, a more meaningful question would be:

To what extent protected areas should endure human intervention? This issue is discussed in the next section.

Regarding the question of who makes and manages protected areas, various levels of governments designate protected areas. National parks have been the most representative form of modern protected areas since Yellowstone. They are normally designated by national governments, as the name suggests. Many sub-national governments, such as the states in the United States and the provinces in Canada, have their own protected areas, too. Lower-level governments such as counties, cities, towns and villages can also have parks. Local parks are generally small in size, but often provide amenity to nearby residents and visitors.

At the international level, IUCN categorizes and inventories protected areas around the world, and the World Commission on Protected Areas, one of the IUCN commissions, leads global coordination. There are other international schemes that recognize protected areas of particular importance. Major examples are the Convention Concerning the Protection of the World Cultural and Natural Heritage, the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), and the Man and Biosphere Program (Harrison 2002).

Still, national governments are the principal players in protected area policy. Neither the IUCN nor the World Commission of Protected Areas actually designates or manages protected areas. National governments are the ones to nominate candidates for recognition by the international schemes such as the World Heritage List. Once approved, management of the sites usually remains the duty of national governments. Furthermore, many of the internationally recognized areas are overlapped with national parks and other protected areas, which are already designated in domestic schemes.

Arguments for protected areas in seminal works

The objectives of protected areas have changed over time. Early parks, especially in North America, were established with main objectives of use for tourism and recreational purposes, and preservation of wild landscapes (Sellars 1997). Images of wilderness played an important role for early protected areas, such as the vastness of the land, locations far away from cities, and a state of nature not disturbed by human activities. Early national parks also tended to emphasize geological, rather than biological, features and landscapes (Nelson 1997). Protected area objectives have since widened to include biodiversity conservation, maintenance of environmental services and cultural values, sustainable use of natural resources, scientific research, education, tourism and recreation, in addition to wilderness protection (IUCN 1994).

Advocates argue that protected areas are “the single most important way” to ensure the long-term survival of most species (MacKinnon 2001, 1), and “among the most effective means of conserving biological diversity in situ” (Green and Paine 1999, 18). As humans impose increasing pressure on the natural environment, the mandate of spatial protection against destructive practices becomes more crucial. It is no wonder that protected areas are described as essential in a number of seminal reports on conservation published during the past several decades.

The *World Conservation Strategy* (IUCN, UNEP and WWF 1980) discusses protected areas in three contexts. First, in the context of genetic diversity, the Strategy regarded in situ preservation a preferred measure, while ex situ protection such as zoos and botanical gardens can work as a safeguard. Protected areas are key to in situ preservation. Second, in the context of rural development, the Strategy emphasized the importance of involving local communities in protected area management, finding livelihood alternatives to resource use causing excessive pressure on the ecosystems, and compensating the local people for the opportunity costs of foregoing extractive use of natural resources. Third, in the context of the comprehensive strategy towards

sustainable development, the Strategy proposed to establish a comprehensive network of protected areas, securing the habitats of threatened, unique and other important species, as well as representative types of ecosystems. The World Conservation Strategy posits conservation as a means to rural development (Allen 1980), giving special attention to tropical forest conservation. The importance of protected areas is reconfirmed in a successor report entitled *Caring for the Earth*, with particular emphasis on the national-level systems of protected areas (IUCN, UNEP and WWF 1991).

The World Commission on Environment and Development chaired by Gro Harlem Brundtland published its report titled *Our Common Future* in 1987. It promoted the concept of sustainable development, building the basis for discussions at the Earth Summit in 1992. The report also calls for new and diverse strategies to make protected areas economically viable. Probably the most influential statement of the report in terms of protected areas is that "a consensus of professional opinion suggests that the total expanse of protected areas needs to be at least tripled if it is to constitute a representative sample of Earth's ecosystems" (WCED 1987, 165-166). Since the total terrestrial coverage of protected areas in the world at that time was approximately 4%, the report's message was commonly interpreted and referred to as the 12% target. British Columbia, for example, became the first Canadian province in 2000 to achieve its target to protect 12% of its territory.

On the eve of the Earth Summit, the *Global Biodiversity Strategy* (WRI, IUCN and UNEP 1992) was compiled as the basis of the negotiations that led to the adoption of the Convention on Biological Diversity at the Earth Summit. The Strategy elaborated the significance of biodiversity protection as a matter of maintaining the earth's life-support systems and securing the survival of humanity. It assesses biodiversity at three scales (genes, species and ecosystems), and summarizes arguments for biodiversity conservation as: saving, studying and using. The Global Biodiversity Strategy devotes one chapter (Chapter VIII) to a comprehensive analysis of protected areas. It calls for strengthening national protected area systems, with support from international organizations such as IUCN. The Strategy also endorses the idea of diversifying the forms of and incentives for protected areas.

The World Parks Congress in 2003 celebrated that over twelve percent of the entire land area in the world had been protected (Chape and others 2003). This means that the Brundtland Commission's recommendation has been achieved at the global level. It is safe to say there is a generally shared sense that protected areas are necessary. This does not mean protected areas are sufficient, however, and there are several problems associated with protected areas. The following sections discuss four issues particularly relevant to this research: 1) ecosystem protection; 2) relationships between humans and nature; 3) distribution of benefits and costs; and 4) assessment of effectiveness.

Ecosystem protection

A fundamental critique is that the selection and coverage of protected areas are not adequate from an ecological perspective. There are several issues comprising this deficiency, such as insufficient coverage of important and diverse ecosystems; fragmentation of protected sites; and a lack of enforcement of regulations. These issues are often combined with each other in the same sites, limiting the achievement of conservation goals.

Coverage and distribution of protected areas are likely related to the level of stakes in each site. Protected areas tend to exist where resource values are low, not necessarily where ecosystem values are high. This results in the limited function of protected areas in conserving threatened and other important species at the global scale (Rodrigues and others 2004). A study by Scott and

others (2001) also shows insufficient representation of natural vegetation types in protected areas in the western United States. In terms of forest protection, the ninth Conference of Parties to the Convention of Biological Diversity agreed in 2008 that at least ten percent of all types of forests worldwide should be protected. The 10% target was politically influential, although detailed analysis of high resolution satellite data from ecological perspectives show insufficient protection in forests with rich biodiversity (Schmitt and others 2009). Bücking (2003) proposes to classify three threshold sizes of protected areas as 1) large (several thousands of ha), 2) medium (1000 ha), and 3) small (> 100 ha), as a practical approach to enhancing the role of protected area networks in protecting populations of both fauna and flora.

Isolation and fragmentation of protected areas may occur where their surrounding areas have been transformed greatly, which can limit their effectiveness. Even where rules are strictly enforced inside protected areas, assessment of effectiveness in achieving their conservation objectives depends more or less on factors from surrounding areas. For example, tree harvesting near protected areas can create edge effects within the reserve, changing water flows, sunlight exposure, species dynamics, and other environmental conditions (Camaron 2006). Insufficient environmental management outside protected areas can make them dispersed islands (Dearden and Rollins 2002).

At the site level, enforcement of regulation is often difficult. Conservation objectives can be jeopardized by human activities in and around surrounding areas, such as agriculture, forestry, hunting, water extraction and pollution, and war (Zupancic-Vicar 1997). Implementation is a common challenge to protected areas in many countries. Protected areas without strict rule enforcement are sometimes sarcastically called *paper parks*. The effectiveness of such parks in achieving conservation objectives is questionable, although they add to numbers and total areas in the statistics (Dudley and others 1999). Chai and others (2009), for example, report that the rate of forest clearance within Jamaica's mountain protected areas remains as high as their pre-designation period.

These concerns have led to an increasing attention to ecosystem-based approaches, which recognize that the state of nature is in flux, continually affected over time and space by interacting processes like plant succession, animal behavior, human influence, and the connectivity between protected areas and surrounding uses (Zimmerer 2000). The term *ecological integrity* has been widely used as a key principle for improving protected area systems (Ecotrust Canada and Ecotrust 1997). A panel of experts formed by the federal government of Canada defined ecological integrity as the state when a given ecosystem is "deemed characteristic for its natural region, including the composition and abundance of native species and biological communities, rates of change and supporting processes" (Parks Canada Agency 2000, 2). An experts' group in British Columbia emphasizes the intactness and self-sustenance of ecosystems and their processes of renewal, which are considered important for biodiversity conservation (Legacy Panel 1999). Although these reports appear to mention only natural systems at a glance, they are much relevant to regulations of human actions in pursuing ecological integrity. This confirms the old adage that managing ecosystem services largely means managing human behavior.

Another concept relevant to ecosystem-based approaches is *adaptive management*, which integrates economics, ecology and social science in order to understand and maintain the resilience of natural ecosystems, since each discipline is important but insufficient by itself (Holling 2000). Adaptive management is an influential concept, rather than an established method of practice (Lee 1999). It encourages managers and policy makers to be flexible in each stage of decision-making cycles (Lal and others 2001), and such capacity can be enhanced through implementation (Sayer and Campbell 2001). This approach regards interventions as scientific

experiments in controlled conditions, which would provide lessons for future management strategies.

There is an increasing need to protect diverse types of ecosystems, and connect those protected areas with one another, to wider landscapes, and to society and economy locally and globally, in addition to simply expanding them in size (Crofts 2004; Dudley and others 1999). Adaptive ecosystem-based approaches are expected to better respond to uncertainties embedded in ecological processes. Some of the uncertainties are inherent in stochastic processes like population fluctuations; others are caused by external forces such as climate change (Noss 2001). Protected areas tend to be static in their boundaries as well as their management priorities. The dynamic nature of ecosystems, both temporal and spatial, needs to be taken into account in decision making, and ecosystem-based approaches aim to facilitate that process.

In contrast to coarse filter approaches that look broadly at ecosystems, protection of particular species is a fine filter approach to the conservation of biodiversity. This approach targets species that are considered important and threatened. Although its focus appears narrow, species protection can contribute to broader biodiversity conservation because “as a practical matter we cannot save the whole unless we focus on species – and build up from there” (Houck 1997: 975). In fact, the Endangered Species Act of the United States and the Species at Risk Act of Canada both recognize the importance of ecosystems to protect species at risk (Deguise and Kerr 2006; Houck 1997). Species protection includes both in situ and ex situ measures. The former requires conservation of habitats, for which protected areas can play a central role. Species protection can also extend conservation measures beyond the boundaries of protected areas. Ex situ protection is carried out at zoos, botanic gardens, aquaria, and in some cases, gene banks, in order to complement in situ protection (WRI, IUCN and UNEP 1992).

A positive by-product of species protection is the promotion of cooperation between multiple governments. Many migratory species at risk, for example, need protection in more than one country. The Convention on Biological Diversity, the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), the Ramsar Convention, and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington Convention) are major examples of legal frameworks formalizing international cooperation. There are also a number of regional and bilateral agreements aiming for protection of particular species. These efforts help expand protected areas beyond national jurisdictions and connect them together.

Identification of target species is based on scientific evidence as well as society’s preference. The use of a popular species as a flagship is sometimes a wise strategy for gaining stronger support from the general public as well as a larger budget (WRI, IUCN and UNEP 1992). Protected areas can also benefit from scientific data collected on target species in prioritizing measures and elements for protection (Brooks et al. 2004). This might help narrow the gap between ecosystem representation and actual distribution of protected areas. Thus, species protection and protected areas can complement each other in biodiversity conservation.

Human-nature relationships

There is a long-standing debate over the human presence in nature. On one side of the debate is a claim that nature has a better chance of being preserved if there was no human intervention. This is backed by a belief among some deep ecologists in the intrinsic value of non-human organisms and their rights to exist and survive. This principle was in part developed as an extension of human right movements for minority groups (Nash 1989). Dion (2000) argued for protection of all ecosystems for ethical reasons, while acknowledging varying intrinsic values held

by different groups of species from “higher” animals (self-conscious mammals) to inorganic materials.

Advocates for preserving nature without humans sometimes come into conflict with defenders of the fundamental rights and dignity of indigenous and poor people. The latter group tends to argue that nature conservation should incorporate the human presence and interventions as long as they are sustainable. In some cases, residents in and around state-established protected areas have been excluded from access, use and decision-making (Colchester 1996; Cronon 1995; Garcia-Frapolli and others 2009; Stevens 1997). They are often people already politically and economically disadvantaged, especially indigenous people. Hess (2001, 160) characterizes the so-called “Yellowstone model” of protected areas as “state expropriation of customary tribal lands.” In some cases, indigenous people have been relocated to other places where their knowledge for sustainable use could not be applied due to different conditions. The Yellowstone model is also criticized for breaking traditionally sustainable relationships between ecosystems and humans, as well as for disregarding indigenous people’s rights to live on their homeland and use natural resources for subsistence (Stevens 1997).

In Canada, some protected areas have been established where indigenous peoples have lived for generations, and some of these areas are subject to treaty negotiations and land claims. Cultural diversity has generally not been a priority, however, in identifying important natural areas. The government has often dealt with indigenous peoples with ad hoc policy that leads to inconsistency as well as flexibility (Peepre and Dearden 2002). Protected area policy, therefore, may discourage the sustenance of unique cultures, possibly resulting in serious social problems in some cases. As such, protected areas and indigenous peoples are not always an easy combination. After several court cases, more cooperative arrangements such as co-management have been developed in some areas, although the current overriding principle of ecological integrity does not guarantee an increase in participation of indigenous peoples (Peepre and Dearden 2002). The issue becomes more complex where other stakeholders, such as the Department of Fisheries and Oceans (jurisdiction over marine resources), logging companies, and environmental groups, are actively involved.

Wilderness preservation has been used to justify the exclusionary approach, but the concept of wilderness itself has been questioned. For example, the concept of wilderness in Australia acknowledges settlements by aboriginal peoples (Herath 2002; Russell and Jambrecina 2002), unlike the definition in the US Wilderness Act of 1964. Some claim that human hands have always intervened with nature, and the image of wilderness as pristine nature untouched by humans at all is only a myth (Cronon 1995; Soule 1995). This position tends to encourage the maintenance of sustainable resource management by local, particularly indigenous, groups, as well as their participation in decision-making processes (Himes 2007; Lockwood 2010; Zimmerer 2000). As conservation movements were brought to developing countries, the theme was no longer solely nature but coupled with poverty alleviation, human rights and well-being of local people, developing into the notions and practices generally labeled as integrated conservation and development. Such terms as community-based conservation, community-based natural resource management, integrated conservation and development have been used to address this theme.

In general, growing attention is being paid to integrative relationships between nature and humans, instead of dualistic separation of the two. The World Heritage categories, for example, have broadened the interpretation of cultural landscape in the early 1990s to acknowledge the positive link between nature and culture (Head 2000). Through remapping processes, including the designation of protected areas, ideals of wilderness can be reconciled with the concept of cultural landscapes (Phillips 1997; Clapp 2004). Large conservation NGOs once followed the cultural

landscape approach, although they produced limited success because those organizations tended to lack expertise in working collaboratively with local people, and also transformed themselves into even larger, corporate-funded bodies (Chapin 2004). Lovejoy (2006) argues that lessons should be learned from experiences of integrated conservation and development projects, rather than rushing to judge that they failed.

Community-based conservation by definition need not be directly tied with protected areas, but it often assumes involvement of local people in protected area policy (Campbell and Vainio-Mattila 2003). Their review concludes that dissatisfaction with community-based conservation results partly from a lack of expertise in participatory approaches among conservation practitioners (Campbell and Vainio-Mattila 2003). My view is that community-based approaches can improve by integrating political, social and economic processes more explicitly into individual cases, and that past failures should provide lessons to guide this improvement, not as justifications for returning to an exclusionary model of conventional protected areas (Brechin and others 2002; Wilshusen and others 2002). Cultural landscapes can remain as one type of protected area, and they are particularly important in small or economically disadvantaged countries where wild nature distant from human settlements hardly exists, and the livelihoods of local people are closely tied to sustainable resource use. Furthermore, if cultural landscapes are excluded from protected areas, some countries would have only few sites, possibly none, left in their lists of protected areas (Dudley 2009). That would only enlarge the discrepancy and tension between conservation and development interests. Brandon and others (2005) claim that biodiversity conservation and local livelihoods can be reconciled by systematic planning.

Protected areas may actually bring local development, rather than always giving up economic opportunities. A study by Wittemyer and others (2008) shows generally higher rates of population growth in areas surrounding protected areas than the average in rural areas of Africa and Latin America, pointing out positive factors such as funds flowing into those areas, and employment opportunities in park management and tourism might have greater influence on park neighbors than negative factors such as land use restrictions; this can be interpreted as protected areas' positive contribution to surrounding communities, as well as increasing pressure with human activities on the natural environment. It should be noted of course that growing human populations around a protected area might undermine its efficacy for conservation.

There are a variety of ways in which grassroots institutions play a leading role for conservation and sustainable use of natural resources. Community-based natural resource management and co-management are examples of concepts proposed in pursuit of combining the well-being of local residents with sustainable ecosystems (Wells and Brandon 1992; Ecotrust Canada and Ecotrust 1997; Jeanrenaud 1999; MacKinnon 2001). One of the key issues discussed at the World Parks Congress in 2003 was community control in areas designated for nature conservation (IISD 2003). Borrini-Feyerabend and others (2004) proposed the concept of community conserved areas to better acknowledge the rights held by indigenous and mobile communities over natural resources. There are indeed cases reported as successes, where local communities have organized themselves to achieve both conservation and well-being of local population, avoiding mass exploitation of natural resources by external corporations (e.g. Shukla and Sinclair 2010).

Conservation Management Networks in Australia are another example of linking protected areas with diverse tenure arrangements (Fitzsimons and Wescott 2004; 2005). Biological corridors in Costa Rica also include areas with varying property owners, in which the two sites studied in this research take part. An initiative called the Mesoamerican Biological Corridor extends the coverage across national borders (these schemes will be discussed in later chapters). The key to these concepts and institutions is the sense of stewardship, which is supposed to encourage local

communities to willingly and responsibly manage ecosystem services (Brown and Mitchell 1997; Dempsey and others 2002).

Co- or joint management is one potential solution for the conflict between indigenous people and park authorities. Two national parks in Australia, Kakadu and Uluru-Kata Tjuta, adopted joint management schemes agreed to by both the local Aboriginal peoples and the government, in order to match the needs of protected areas and the Aboriginal people; the Federal Government of Australia handed back the land title to the Aboriginal communities (in 1978 for Kakadu, and in 1985 for Uluru), under the condition that the land be leased back to the government for use as a national park (Mercer 1994). Annual rents and part of the entrance fees are paid to the communities, and traditional practices like prescribed bush-burning and ceremonies were re-introduced within the framework of park management. The Aboriginal people also gained much decision-making power through the management board created with an Aboriginal majority, and given legal authority to make decisions. The board for Kakadu was established in 1989 with fourteen members. Ten of them were Aboriginal people, two were senior park officials, one represented the tourism sector, and the other was a conservation expert (De Lacy and Lawson 1997). In addition, regular consultation between the government and the Aboriginal sides began as a mechanism of cross-cultural communication, with liaison staff appointed for this purpose.

It is possible to place co-management in the middle of a spectrum ranging between exclusionary parks enforced by government on one end and spontaneous management of natural resources at the grassroots level on the other end. Since conditions are variable over time, and from place to place, it is not appropriate to simply apply either top-down or bottom-up approaches in the conservation of land and natural resources (Dearden 2002). What is important, instead, is to analyze the diverse interests of stakeholders, the existing and potential constraints to conservation, and possible institutional arrangements that would be suitable for each case.

There is a challenge in the community-based approaches: achieving multiple goals is much more difficult than a single one. A critique is that by emphasizing human use excessively, some protected areas are not protecting anything. Particular targets of this accusation are areas of Category V/VI types, which, according to critics, contribute so little to biodiversity conservation that they would more accurately be called sustainable development areas (Locke and Dearden 2005). This dissertation explores a different path of integrating community-based approached with protected area networks, by focusing on how common and individual properties can aggregate to form large conservation territories without sacrificing the well-being of local people.

Distribution of benefits and costs

Robbins and others (2009) point out that illegal resource use by local people can be a customary institution that is as robust as the restriction imposed by protected area legislation. Enforcement of nature conservation in areas in or near human settlements is very difficult without compatible attitudes and behaviors by local people. Outsiders also influence performances of protected areas. Whether people act for conservation depends partly on how benefits and costs are distributed among stakeholders. Visitors to a national park, for example, benefit from the ecosystem and human services in the park. Tour operators and shops in the area benefit from outsiders' visits. Recreational benefits are experienced by visitors, and profits in the service sector are gained by operators. If the ownership of those operations belongs to outside businesses, it generally means that benefits leak out of the local community. Designation of a protected area incurs not only operational but opportunity costs due to forgone economic gain from other land uses (Selman 2009). Restriction of land development can be a benefit from the conservationist

perspective but a cost from an economic perspective. Trade-offs are often present, too, between objectives, between sites, and between stakeholders.

Parks are subject to increasing environmental impacts as more and more people visit them. Park operation is a costly business: employment of staff, and the construction and maintenance of trails and other infrastructure incurs cost, for example. These costs are not fully paid by direct users of the services in many cases. Governments usually allocate their budget to cover these costs in their protected areas. This distributes costs among all taxpayers, without considering who receives more benefit than others. In other words, some protected areas have no mechanism to collect payments from direct beneficiaries such as visitors and tour operators (Hess 2001). As the number and size of protected areas grow, the costs of management also increase. When a government designates a protected area without sufficient funds, it is likely that the area will receive little management or rule enforcement. This situation produces paper parks.

An IUCN report identifies different sources and channels of funds for management of protected areas in the international, national and site levels, and recommends a “business approach” to identify existing and potential “customers” and make them pay for the management cost (IUCN 2000). Dharmaratne and others (2000) argue for promoting the role of tourism in financing protected areas, by recovering both use and non-use values from beneficiaries. Use values in this case are expressed by what visitors are willing to pay for entrance, and non-use values are the willingness to pay of the general public for conservation of the natural environment (Dharmaratne and others 2000).

Public-private partnerships are one way to allocate the cost to other sources outside the public budget. Private management might be effective in popular parks, where use values could be converted into dollars and used directly to pay for management costs (Eagles 2009). Private corporations are generally thought to be more flexible and adaptive to socio-economic conditions (Eagles and others 2002). Private businesses, however, do not necessarily take into account the intrinsic values of the natural environment. These values, mostly being external to the market economy, are what many protected areas attempted to protect in the first place. In an extreme scenario, only profitable parks would be considered successful. Simplistic privatization could undermine the fundamental conservation objectives of protected areas. Burdens should be shared by a range of stakeholders, and profitability should not be the top priority in protected area policy.

The issue of benefits and costs may lead to conflicts. One example is Chichibu-Tama-Kai National Park in Japan. This park is the national park closest to downtown Tokyo, and attracts many hikers throughout the year. It is one of the national parks in Japan where part of the park’s land is individual private property (under Japanese law, national parks need not be exclusively government property). In April 2000, after unsuccessful negotiations, the individual landowner of part of Chichibu-Tama-Kai National Park closed a trail within his property that had been used by many visitors. With no direct benefit provided by the heavy traffic of hikers, the owner claimed there had been an old promise between his father and the government officials about tax benefits, which had not been actually applied. The fundamental reason for this trouble was a lack of formal agreement to clarify how to share the benefits and costs of the park use among the stakeholders including the national and local governments, property owners, and visitors. In fact, almost a quarter of the total national park area in Japan is on private land, but in many cases, both legal and informal mechanisms to share costs are missing (Kato 2001). Most notably, there is no system of collecting entrance fees in the national parks in Japan, making visitors free riders. Park offices have insufficient personnel and financial capacity, and rely on individual owners to bear part or most of the costs of park management including maintenance of trails. In such a situation, there is little

incentive for a private owner to keep his or her land as a park, foregoing other potential economic opportunities.

A key term for addressing this issue is *incentive*, which incites or motivates (FAO 1987). Incentives and disincentives are a powerful tool for conservation that can be applied as a policy tool to address market failure by internalizing various costs derived from human intervention with nature. If designed and implemented appropriately, they can contribute to increasing motivation for undertaking conservation-oriented actions. For clarity of discussion, this section uses the term incentive to refer to monetary rather than moral values. There are many tools for market-based measures in environmental policy such as charges, deposit-refund systems, marketable permits, subsidies, tax benefits and soft loans (Fukuoka 2000). Charges are usually imposed against emitters, producers, users or disposers of pollutants or waste, based on the polluter-pays principle. Marketable permits convert the amount of pollutant discharge into tradable units. Deposit-refund systems and pricing policy may encourage material recycling and use of environmentally benign technologies or resources. Some of the measures like charges for pollution establish restrictions and disincentives to discourage undesirable practices, while other measures create positive incentives for desirable practices.

One way to realize economic rewards for conservation is ecotourism. It aims to capture the growing demand for nature-based vacations of affluent tourists from developed countries. Ecotourism can encourage natural areas to be protected primarily for low-impact tourism, rather than for industrial or urban development. It is perhaps the most significant incentive linking conservation with economic development. Khadka and Nepal (2010) document cases from Nepal in which a village engaged in tourism has much more active participation by villagers than another village without tourism. This shows linkages between incentives and grassroots governance.

Another incentive for conservation and sustainable resource use is to certify goods and services that are produced in an environmentally sensible manner. It is often a producer's voluntary choice to seek certification, although there can be pressure from the demand side of the market. Therefore, it can be regarded as a tool to link producers and consumers who share common interests. Certification schemes may emerge as a new ethic prevails in a society. There may be a stage when many certification schemes compete with each other, followed by a next stage when a small number of them survive the competition to become the standards while eliminating most others. Ecotourism programs and products have a number of domestic and international certification schemes, although none of them has gained a dominant status. For any certification scheme to be widely accepted, it must have a high level of credibility. At the same time, there must be sufficient awareness among the public to support it, and even in some cases to pay more. In this sense, it relies heavily on environmental education. It might be a means to involve not only producers and consumers but also other interest groups. Dickinson (1999) proposes that environmental NGOs should work as a facilitator to link local communities and enterprises in forest management. My view is that there can be various roles in the civil society groups ranging from watchdogs to moderators.

Despite all the advantages in theory, use of market incentives for conservation in practice is not always easy. A study by Crook and Clapp (1998) revealed obstacles to market-oriented strategies for conservation of tropical forests. The study concludes that those strategies have limits on their capacity to fully substitute for protected areas for forest conservation, although it acknowledges the potential of market-oriented strategies if a few key conditions are satisfied. Those conditions include existence and strict enforcement of resource management regulations, as well as stable property rights (Crook and Clapp 1998). Biological prospecting to explore genetic materials and data for pharmaceutical production is an example of newer incentives to protect

ecosystem services, although such initiatives can become another type of enclosure if access and benefits are not shared in an equitable manner (Mulongoy and Chape 2004).

Assessment of effectiveness

All the above problems are related to each other and ultimately come down to the fundamental question of whether protected areas are effective. Several studies have found protected areas to be effective, but agree that more systematic and comprehensive data collection and analysis are needed (Bruner and others 2001; Chape and others 2005; Gaston and others 2008). The IUCN guidelines for effectiveness assessment of protected areas adopt a framework based on a management cycle with six stages: context, planning, inputs, processes, outputs and outcomes (Hockings and others 2006). The framework is simple but comprehensive enough to include fundamental questions of why the area in question needs protection and what outcomes have been achieved, in addition to more operational questions of how the area is managed. This broad coverage is important because management effectiveness should be assessed against clear objectives set in advance. Another characteristic of this framework is the distinction between outputs and outcomes. It assumes both direct results from inputs such as reduction of solid waste in the area, and longer-term achievements such as changes in perceptions among the general public. Moore and Walker (2008) present an example of evaluation of management effectiveness in tourism-oriented protected areas in Australia, based on the IUCN framework. This shows that the framework can be adjusted and applied to actual evaluation in different settings.

A virtue of the framework based on the project cycle is that it can be used at each stage of the project with feedback to help adapt the management plan. Its applicability might be limited where an area is not managed in a project style, however. For long-term goals of conservation, it is not easy to set a specific timeline, budget, or output. Timko and Innes (2009) claim that protected areas tend to set priority indicators beyond their capacity of monitoring. In order for protected areas to achieve the goal of protecting biodiversity and other ecosystem services, both present states and management actions should be monitored, and the results be reflected in management cycles for adjustment (Timko and Innes 2009).

Lockwood (2010) focuses on governance structures that would affect performance outcomes, with seven principles: legitimacy, transparency, accountability, inclusiveness, fairness, connectivity and resilience. Lockwood's framework builds upon that by Hockings and others (2006) mentioned above, conceptualizing governance as a fundamental structure of power and responsibility, as opposed to management as a more operational activity with plans and resources. Lockwood's seven principles show an acknowledgement of diverse actors in protected areas, requiring re-examination of criteria and indicators. In other words, government is not the only actor in protected area governance, and assessment should reflect perspectives from diverse stakeholders. Nkhata and Breen (2010) propose a framework to link governance (multi-stakeholder interactions governance) and management (implementation processes) as integrated learning systems. This approach suggests that strategic planning and day-to-day operation should not be disconnected, and effectiveness assessment can be a useful process for linking them together. This appears to be common to these frameworks including the one proposed by IUCN.

Garnett and others (2007) propose a comprehensive framework with criteria of natural, human and other capitals in the context of evaluating interventions pursuing both conservation and development, pointing out trade-offs among the objectives. Timko and Satterfield (2008) propose a set of criteria and indicators for evaluating the effectiveness of protected areas, addressing both ecological integrity and social equity. This framework sheds light on land rights, including those of indigenous peoples, livelihood options for local residents, and other social criteria before examining

ecological criteria. This I find is the strength of this framework, which appears more acceptable for indigenous communities.

Protected area evaluation in terms of biodiversity conservation is conducted in different spatial scales examining different features of biodiversity. Meta-analysis for connecting those multi-scale and multi-variable evaluation schemes is a difficult challenge, which is yet to be done (Gaston and others 2008). As protected areas become more and more diverse in terms of size, goals and governance structures, their effectiveness needs to be assessed in a more adaptive manner.

Conclusions

Protected areas play a central role in conservation of ecosystem services, a role that cannot be replaced completely by other approaches. Expansion in the total number and area of protected areas, therefore, is reasonable. It is also true, however, that protected areas have fundamental weaknesses in various aspects such as: coverage of important ecosystems; insufficient ecological integrity and protection; often contentious relationships between conservation and social interests; inequitable distribution of benefits and costs; and effectiveness to be assessed.

There are options for addressing these problems, which include ecosystem-based approaches, community-based approaches, incentive-based approaches, and combinations with other approaches such as species protection, science and education. Increasing diversity in the types of protected areas involves a wider variety of stakeholders (James 2001; McNeely 1999). Identification of all stakeholders is not an easy task, however. Hess's (2001) division of stakeholders with park management authorities, local communities, and interested outsiders, for example, is rough but useful to begin with. This dissertation will offer a more detailed breakdown of stakeholder types and property rights or interests (see Chapter 8). Then, the roles, benefits and costs should be clarified for each stakeholder in order to make protected areas more inclusive, equitable and acceptable.

Self-governing institutions at the local level can be as effective for nature conservation as officially protected areas, suggesting that legally protected areas are not the only type of institutions (Hayes 2006). In other words, some of the legally protected areas would be locally driven, and some of the grassroots institutions would play a similar role as legally protected areas. The theory of common property has potential not yet fully realized in contributing to the improvement of the protected area policy (Murphree 2002). Building on the knowledge of both protected areas and common property, this research aims to conceptualize the hybrid institutions and examine the underlying preconditions and factors. Chapter 3 lays out the theory of common property and its applications to protected areas, outlining the hybrid concept of a Common Property Protected Area. This concept is applied to case studies in Chapters 6 and 7, and based on the observations from the case studies, Chapter 8 presents an analytical model of the stakeholder identities, interests, rights and obligations involved in common property protected areas.

Chapter 3: Common Property Protected Areas as a Hybrid Concept

Introduction

This chapter defines and elaborates the concept of common property protected area (CPPA) as a hybrid of common property and protected areas. The chapter first compares the representative characteristics of common property with those of protected areas, highlighting the fundamental differences between the two. It then defines CPPA, and explains its potential merits. Finally, a list of preconditions and promoting factors for CPPAs is proposed, after referring to the criteria listed in the literature of common property, protected areas, community-based natural resource management, resource co-management and ecosystem management.

Different characteristics in the two fields

While both common property and protected areas can be understood as institutions determining how humans manage nature and environmental resources, there are several differences between the two. My review of both bodies of literature led to the following synthesis. Before moving into the discussion, however, two points should be noted. First, there are diverse kinds of examples in these institutions and some might not fall into the description presented here. Second, the main purpose of my analysis is not just to highlight the differences but to establish a foundation for possible linkage between the two institutions.

A first difference is about ways of governing. Many examples of common property institutions are local, self-forming ones, which can be described as grassroots. In contrast, conventional, exclusionary model of protected areas are often top-down government initiatives, although other, more participatory types of protected areas do exist in recent times.

A second difference is that common property regimes often have specific resources, such as a species of fish or tree, and irrigation water, as their objects of management. Often, these resources can be measured and traded. The central objects of protection in protected areas are often services, not goods, of nature, such as landscapes, ecological integrity, and biological diversity, which cannot be measured or traded easily. There are other examples such as marine protected areas that restrict overfishing. However, more conventional, preservation-oriented protected areas tend to be concerned with protection of the natural environment, rather than resource extraction. Two terms are used here with a purpose: resource and environment. A resource is a clearly identified input to a subsequent process such as eating, burning and building, while the environment is a whole variety of things surrounding any subject. This is consistent with Zimmerman's (1951, 15) famous phrase: "Resources are not; they become." This distinction leads to my third point.

A third difference, closely related to the second, is in usage. Common property regimes are typically concerned with extractive uses, such as fishing, grazing, and logging. In contrast, many protected areas have their objectives related to non-extractive values and uses like recreation and scientific research. Some strict nature reserves even prohibit entrance in order to protect the intrinsic values of the environment.

Finally, traditional common property regimes are typically formed by a group of local residents intending to exclude outsiders, while protected areas can include a wide range of stakeholders.

Government agencies responsible for the management of protected areas generally have the strongest control over decision-making, often in cooperation with selected scientists. However, there are diverse groups of people with varied levels of stake, such as unidentified park visitors as well as interested people living in distant locations who may never even visit the region. These differences are summarized in Table 2.

Table 2: Contrast between common property and protected areas

	Common property	**Protected areas**
Governance	Grassroots	Top-down
Objects of management	Specific *resources*; measurable and tradable	Services of the *environment*; not easily measurable or tradable
Values/uses of objects	extractive	Non-extractive
Stakeholders	Specific users, often resource-dependent	Widespread, some unidentifiable

Hybrid concept to connect common property with protected areas

The next step is to search for a synergy of the two concepts. Despite the differences discussed above, it is possible to combine the two. It is not necessary to keep adding jargons and acronyms to the already saturated terminology. Just for the ease and clarity of discussion in this research, however, a combined concept can be called “common property protected area” (CPPA) to mean a bounded area of land and/or water under legal or other effective common property governance, and managed for both conservation of the natural environment and sustenance or improvement of local people’s well-being (modified slightly from an early definition by Kitamura and Clapp 2004). This conceptualization emphasizes the overlap between common property and protected areas. This coupling has been weak.

Why and how would a CPPA be important? Simply put, it has the potential to fulfill the dual goal of conservation and community development. The CPPA could enhance connectivity of protected area networks, while improving the socio-economic state of local communities. From the perspective of conservationists, those reserves, each of which might be small by itself, can work together as buffer zones or corridors to connect national parks and other state-established protected areas. It is neither desirable nor realistic to expect the state to acquire all the private lands needed for conservation and assign staff to all of them. Promoting CPPAs, particularly in local communities with high levels of social capital and capacity, is a rational alternative. Governments can play a supportive role by promoting conservation activities in civil society with publicity, official recognition, technical assistance, and financial support.

From the perspective of local communities, those reserves can improve local people’s quality of life by conserving the natural environment and diversifying income sources, provided that there are sufficient financial mechanisms, including ecotourism revenues and government subsidies, to make up for the withdrawal of these lands from commodity production. CPPA, therefore, has high potential to reconcile conservation goals with sustainable community development.

Preconditions and promoting factors

A next task is to propose a set of key preconditions and promoting factors for CPPAs. I refer to preconditions as essential conditions prior to establishment, and to promoting factors as forces that support development and/or maintenance. Before undertaking the main task, this section reviews preconditions and promoting factors identified in the relevant fields: common property, protected areas, community-based natural resource management, resource co-management and ecosystem management.

Common property institutions

Identification of preconditions and promoting factors that support institutional arrangements for collective resource management has been one of the major foci in the literature of common property. The design principles proposed by Ostrom (1990) are often cited and applied in other research. Ostrom's principles have seven local characteristics and another broader requirement on coordination with external institutions (Figure 2). As the term "design principles" implies, these criteria focus mostly on how community members set internal rules. In other words, they belong to the social, rather than physical, dimension of natural resources. In my view, the last item of "nested enterprises" considering possible relationships with external institutions in various scales augments the width of analysis and thus raises the value of this study.

Figure 2: Design principles illustrated by long-enduring common-pool resource institutions

(1) Clearly defined boundaries
(2) Congruence between appropriation and provision rules and local conditions
(3) Collective-choice arrangements
(4) Monitoring
(5) Graduated sanctions
(6) Conflict-resolution mechanisms
(7) Minimal recognition of rights to organize
(8) Nested enterprises (when connected to larger systems)

Source: Ostrom (1990)

The "attributes of successful common property regimes" listed by McKean (2000) are also concerned almost exclusively with the social dimension (Figure 3). A strength in McKean's list I find is that it uses the word "right(s)" to illustrate the relationships between local people and external forces, because property rights are a critical issue in resources management particularly in the local scale.

Figure 3: Attributes of successful common property regimes

(1) User groups need the rights to organize themselves, or at least there is no interference with their attempt.
(2) The boundaries of the resource must be clear.
(3) The criteria for membership in the group of eligible users of the resource must be clear.
(4) Users must have the collective right to modify their rules of the members' individual uses over time.
(5) Use rules must correspond to what the system can tolerate and should be environmentally conservative to provide a margin for error.
(6) Use rules need to be clear and easily enforceable (so that no one need be confused about whether an infraction has occurred).
(7) Infractions of use rules must be monitored and punished.
(8) Distribution of decision-making rights and use rights to coowners of the commons need not be egalitarian but must be viewed as "fair" (one in which the ratio of individual benefit to individual cost falls within a range they see as acceptable).
(9) Inexpensive and rapid methods are needed for resolving minor conflicts.
(10) Institutions for managing very large systems need to be layered with considerable devolution of authority to small components to give them flexibility and some control over their fate.

Source: McKean (2000)

Meinzen-Dick and Knox (2001) identify several characteristics of the resource or the user group, which are assumed to increase the likelihood of emergence and survival of collective action in resource management (Figure 4). These characteristics are explained in a very descriptive, if not vague, language, making them difficult to measure. An example of this problem is "a long time horizon" held by users. Nonetheless, there is a virtue in the inclusive tone. For instance, the third item on the size of the management unit contains two opposite requirements, "large enough" and "not so large", which appear to contradict each other at a glance. A more widely suggested requirement is small size (see the synthesis by Agrawal (2002) discussed later). Combining the small size with another human factor implying elite capture, corruption and other forms of power imbalance makes the list by Meinzen-Dick and Knox unique. While a larger size does not guarantee solution to these problems, "neither too big nor too small" is likely to prove useful in observation of complex cases in the real world.

Figure 4: Characteristics of the resource or the user group in collective resource management

(1) There are returns to the resource and importance of the resource for local people's livelihoods
(2) Users have a long time horizon and relatively low discount rate for future benefits
(3) Size of the management units is large enough that they cannot be captured by individuals, but not so large that they cannot be monitored by the group
(4) A history of cooperation and networks among group members (often referred to as "social capital
(5) Local social structure in which divisions are not too serious or disruptive of cooperation
(6) Local leadership with the confidence of the members, and that takes an interest in natural resources

Source: Meinzen-Dick and Knox (2001)

What does "relatively low discount rate for future benefits" mean? This is raised without clear explanation as part of the second criterion in Meinzen-Dick and Knox (2001). There are several possible instances of lower future discounting, which are not mutually exclusive. First, when the resource in question is not a primary and scarce source of subsistence for the users, such as a staple food, there is a better chance that they can wait to extract it. Second, even if the resource is not directly consumed by the users, it may provide them with sources of income in such forms as sales and wages. When there is no alternative to that livelihood, the users have no choice but continue resource extraction. Third, even when the users have alternative livelihoods, it may make sense economically to extract the resource now so that the money earned can be used for investment. Solely saving it in a bank account would give an extra income in the form of interest. This would generate an incentive. Where there are uncertainties about availability of the resource in the future, the incentive generally becomes stronger. For example, in the case of a resource without a clear property regime, someone else may extract it tomorrow if one doesn't today. Or the resource itself may be degraded by erosion, infestation, a natural disaster, or another unforeseen event. Furthermore, the market may place a lower value on the resource due to a number of factors such as introduction of competitive alternatives. Taking all these possibilities into account, low future discounting rate is a much more comprehensive, though less plain, expression than "low level of poverty" (Agrawal 2002), for example.

The list of "critical enabling conditions for sustainability on the commons" compiled by Agrawal (2002), as an output of his review and synthesis of the literature of common property, includes more than thirty criteria (Figure 5). The originality of this work lies not only in its comprehensive coverage but also in the way these criteria are clustered. Characteristics of resource systems and user groups can be understood as basic preconditions, while institutional arrangements are close to Ostrom's design principles. Resource systems' relationships with user groups and institutional arrangements connect basic principles and design principles. The external environment cluster covers social, political, economic and technological criteria. Where many preconditions and promoting factors are identified, clustering them is useful. Agrawal's study demonstrates one way of clustering purposefully.

Figure 5: Critical enabling conditions for sustainability on the commons

(1) Resource system characteristics
- (i) Small size
- (ii) Well-defined boundaries
- (iii) Low levels of mobility
- (iv) Possibilities of storage of benefits from the resource
- (v) Predictability

(2) Group characteristics
- (i) Small size
- (ii) Clearly defined boundaries
- (iii) Shared norms
- (iv) Past successful experiences – social capital
- (v) Appropriate leadership – young, familiar with changing external environments, connected to local traditional elite
- (vi) Interdependence among group members
- (vii) Heterogeneity of endowments, homogeneity of identities and interests
- (viii) Low level of poverty

(1 and 2) Relationship between resource system characteristics and group characteristics
- (i) Overlap between user group residential location and resource location
- (ii) High levels of dependence by group members on resource system
- (iii) Fairness in allocation of benefits from common resources
- (iv) Low levels of user demand
- (v) Gradual change in levels of demand

(3) Institutional arrangements
- (i) Rules are simple and easy to understand
- (ii) Locally devised access and management rules
- (iii) Ease in enforcement of rules
- (iv) Graduated sanctions
- (v) Availability of low-cost adjudication
- (vi) Accountability of monitors and other officials to users

(1 and 3) Relationship between resource system and institutional arrangements
- (i) Match restrictions on harvests to regeneration of resources

(4) External environment
- (i) Technology:
  - (a) Low-cost exclusion technology
  - (b) Time for adaptation to new technologies related to the commons
- (ii) Low levels of articulation with external markets
- (iii) Gradual change in articulation with external markets
- (iv) State:
  - (a) Central governments should not undermine local authority
  - (b) Supportive external sanctioning institutions
  - (c) Appropriate levels of external aid to compensate local users for conservation activities
  - (d) Nested levels of appropriation, provision, enforcement, governance

Source: Agrawal (2002)

Protected areas and natural resource management

Protected areas have been evaluated in terms of their effectiveness. Based on the experience in Fraser Island and the Great Sandy Region in Queensland, Australia, Marc Hockings (1998) presented a framework for evaluation of protected areas. This was developed into a task force project of the World Commission on Protected Areas, one of the thematic bodies in the International Union for Conservation of Nature (Figure 6). Hockings' framework categorizes the six criteria based on the stages in a cycle of protected area management, from designing to dissemination. One positive feature of this framework in my view is the distinction between output and outcome. Output evaluation is done by monitoring specific activities at the operational level, whereas outcome evaluation examines appropriateness of broader goals, as well as their effectiveness (Hockings and others 2000). Results of outcome evaluation can be used for providing feedback for the planning in a next management cycle (Hockings 1998). In some cases, the feedback is useful for visioning (context setting), a very first step in a new program cycle (Hockings and others 2000). A sound understanding of different tasks in each stage in a management cycle, as clarified in Hockings' framework (updated later by Hockings and others（2006）with the six criteria maintained) is useful in designing and implementing the evaluation of a project particularly with a clear time line.

Figure 6: Framework for evaluating effectiveness of protected areas based on management cycle

(1) Design issues
  (i) Context: significance, threats, vulnerability, national context
  (ii) Planning: legislation and policy, system design, reserve design, management planning

(2) Appropriateness of management systems and processes
  (i) Input: resourcing of agency, resourcing of management, partners
  (ii) Process: implementation of management processes

(3) Delivery of protected area objectives
  (i) Output: achievement of planned work program, services and products
  (ii) Outcome: impacts/effects of management with regard to objectives

Source: Hockings and others (2000)

In addition to common property and protected areas, there are other institutions that are relevant to CPPA. Reviewing their criteria helps broaden the perspective for the task of listing preconditions and promoting factors for CPPA. With regard to community-based natural resource management, Kellert and others (2000) comparatively evaluate five cases of community-based natural resource management in Nepal, the United States and Kenya by setting and applying six criteria (Figure 7). Because the purpose of this list is to facilitate evaluation of communal institutions, the criteria focus mostly on the social dimension.

Figure 7: Variables and their attributes for evaluation of community natural resource management

(1) Equity
Distribution and allocation of socioeconomic benefits and resources

(2) Empowerment
Distribution and power and status, particularly among local peoples, including authority developed from central and state governments to local peoples and institutions; as well as participation in decision making, sharing of control, and/or democratization

(3) Conflict resolution
Handling and resolving of conflicts and disputes over resources among local peoples and among local, state, and national entities and interests

(4) Knowledge and awareness
Consideration, incorporation, and production of traditional and modern ecological knowledge in managing natural resources

(5) Biodiversity protection
Conservation and protection of biological diversity and associated habitats, including the preservation and recovery of rare, imperiled, or flagship species, or imperiled populations or stocks of species

(6) Sustainable utilization
Consumptive and non-consumptive utilization of natural resources in ways intended to maintain the long-term availability of these resources in a non-diminished manner for present and future generations

Source: Kellert and others (2000)

In the assessment of community-based institutions, an important first step is to carefully examine the nature of the community in question. Bradshaw (2003) questions the effectiveness of community-based resource management in two aspects: credibility and capacity. Credibility in this case means who represents the community, while capacity includes legal, financial and technical elements. Bradshaw reports a case of Swan Hill, Alberta, in which decisions are made for accommodating the interest of late coming and presumably temporary residents, whereas the aboriginal people who have lived in the area for generations have little control over decision-making. Even where a local community is able to decide its own fate, which interest has a dominant voice is another question.

On co-management of natural resources, Conley and Moote (2003) present a comprehensive overview of the issues on evaluation. An output of the review is the list of criteria that can be use as criteria for evaluation (Figure 8). A special feature of this listing is the emphasis on the processes of goal setting, decision making and other social criteria.

Figure 8: Typical evaluation criteria in resource co-management

(1) Process criteria
- (i) Broadly shared vision
- (ii) Clear, feasible goals
- (iii) Diverse, inclusive participation
- (iv) Participation by local government
- (v) Linkages to individuals and groups beyond primary participants
- (vi) Open, accessible, and transparent process
- (vii) Clear, written plan
- (viii) Consensus-based decision making
- (ix) Decisions regarded as just
- (x) Consistent with existing laws and policies

(2) Environmental outcome criteria
- (i) Improved habitat
- (ii) Land protected from development
- (iii) Improved water quality
- (iv) Changed land management practices
- (v) Biological diversity preserved
- (vi) Soil and water resources conserved

(3) Socioeconomic outcome criteria
- (i) Relationships built or strengthened
- (ii) Increased trust
- (iii) Participants gained knowledge and understanding
- (iv) Increased employment
- (v) Improved capacity for dispute resolution
- (vi) Changes in existing institutions or creation of new institutions

Source: Conley and Moote (2003)

Ecosystem management is another theme of relevance. It intends to enhance ecological integrity in conservation and resource management, by being adaptive to human as well as natural systems. In other words, it is one way to overcome the weakness with prefixed planning and management lacking flexibility against ecological and social dynamics. Slocombe's (1998) "desirable characteristics of ecosystem management goals and objectives" emphasize the importance of including various perspectives and adapting to dynamic changes (Figure 9). While written in the language of resource managers, these criteria, particularly the principles of inclusion and adaptation, have useful implications for CPPAs to be able to cope with diversity and uncertainties in both ecological and human dimensions.

Figure 9: Key considerations in ecosystem management

(1) Imply and reflect specific values and limits (normative)
(2) Reflect “higher” values and ethical principles and rules (principled)
(3) Reflect the wide range of interests, goals and objectives that exist (integrative)
(4) Work with, not artificially reduce, complexity (complex)
(5) Accept and recognize the inevitability of change (dynamic)
(6) Synthesize a wide range of information and knowledge (transdisciplinary)
(7) Be applicable to a wide range of ecosystem types and conditions (applicable)
(8) Involve actors, stakeholders, public (participatory)
(9) Be explainable and implementable in a consistent way to different people and groups (understandable)
(10) Be inherently tentative and evolving as conditions and knowledge change (adaptive)

Source: Slocombe (1998)

The above references were all relevant to the concept of CPPA. There are not so many authors who show clearly compiled criteria. The above lists were selected as suitable references here, although their sets of criteria are established in varying dimensions making it difficult to compare or adopt directly. Instead of using the previous works as a model, therefore, criteria for CPPA should also be listed in an original way. That is the next task.

Preconditions and promoting factors for CPPA

I propose a working list of preconditions and promoting factors with seven categories that are considered important to the establishment and survival of CPPAs. These categories are boundaries, area, community, goal and target, decision-making, stakeholder relations, and driving forces (Table 3).

Table 3: Assumed preconditions and promoting factors for CPPA

Boundaries	Clearly defined spatial boundaries
Area	Small size for each unit, but connected to larger areas
Community	Proximity to the area; absence of severe poverty; low level of dependence on extractive resource use in the area; shared norms; high social capital and capacity (leadership, knowledge, skills, mutual trust among members, institutional base, etc.)
Goal and target	Conservation *and* well-being of local people clearly identified as dual goals; explicit priorities established (key species to protect, activities to implement, etc.)
Decision-making	Participatory and adaptive processes of making decisions
Property rights and roles of stakeholders	Inclusive and nested structure with stakeholders having varying property rights and roles (local community in the core; state, academic and NGOs in the periphery)
Driving forces	Economic incentives and mental values to initiate and maintain the practice

The first two are spatial criteria. Clear boundaries should be relatively less arguable. The literature on both common property and protected areas acknowledges the importance of clear boundaries. Spatial boundaries are an important requirement in defining land-based property rights. There is no reason to propose otherwise in the case of CPPAs. Some boundaries are physically divided by water bodies, ridges and other natural features. Other boundaries are more like human artifacts. Many have both natural and human determinants combined. Where boundaries are fuzzy or in conflict (between jurisdictions, for example), it would not be a CPPA in a complete form. Ownership of an area can only be specified after the area's boundaries are clearly defined. Therefore, clear spatial boundaries can be regarded as a primary requirement for any CPPA.

The second spatial criterion on spatial size is probably distinctive in CPPAs. The literature on common property generally suggests that smaller areas facilitate management and enforcement of the user rules (Agrawal 2002). The literature on protected areas has different viewpoints over whether a single large or several small reserves would be more desirable. It can be understood as a question about how to allocate protected areas where their combined (total) area cannot be simply expanded. Large and migratory species of animals, for example, are assumed to have a higher chance of survival in a larger protected area. Some ecologists favor the strategy to have a higher number of small reserves rather than fewer large reserves, as a way to maintain higher varieties of species in various locations (Higgs and Usher 1980; Gilpin and Diamond 1980). Economically speaking, where opportunity costs of using the land for conservation instead of agriculture are low enough, for example, it is theoretically rational to have a larger number of nature reserves (Groeneveld 2004). In any case, where uses of surrounding areas are beyond the control of a protected area, this protected area would generally be more effective for conservation if covering a larger space. I assume CPPAs should be integrative, taking into account these variables. Each unit of CPPA needs to be small enough so that a local community can manage and monitor human uses effectively. And it can play a greater role in conservation when connected to larger protected areas.

The third criterion concerns local community, which has several dimensions. It can reasonably be assumed that people located in the vicinity would often possess a larger stake in the resource and environmental conditions of the area in question than distant people. Proximity also facilitates monitoring and enforcement of the internal rules, as well as patrolling against encroachers from outside. In addition, the level of dependence on the extractive use of natural resources extracted from the area in question by the community members is an important issue. Where local residents are poor and have no alternatives, they are likely to continue extraction of natural resources. The local community can afford to conserve the resources if its members are not in severe poverty or excessively dependant on particular resources. This seems to be consistent with the idea of low future discounting raised by Meinzen-Dick and Knox (2001). A different position presented in the literature on common property is that the more the community depends on the resource, the more likely the community will become good stewards of the resource (Agrawal 2002). This latter position is not necessarily applicable in conservation of non-extractive values in CPPAs, except where the community's dependence takes non-extractive forms such as ecotourism.

Conventional protected areas take the opposite position by trying to eliminate extractive uses, and even human settlement in core areas for preservation. One of the requirements distinguishing CPPAs is the assumption that the community is located near the area, on which its members do not depend too much on extractive resource use. This differs from both common property regimes and conventional protected areas. Other items in this category are less arguable, including knowledge, skills, leaderships, mutual trust and other human and social capital. Generally speaking, self-regulation for sustainable resource use is more likely by a group, in which members know each other so that mutual trust, reciprocity and norms would effectively function (Ostrom and others

1999). This indicates that a spatially tight community with a limited number of members could be a better steward than a large, dispersed group.

The fourth criterion for CPPAs is that the goals should include both conservation of the natural environment and well-being of local people. Where possible, these dual goals should be articulated in the form of clear objectives and targets, such as key species to protect and activities to implement.

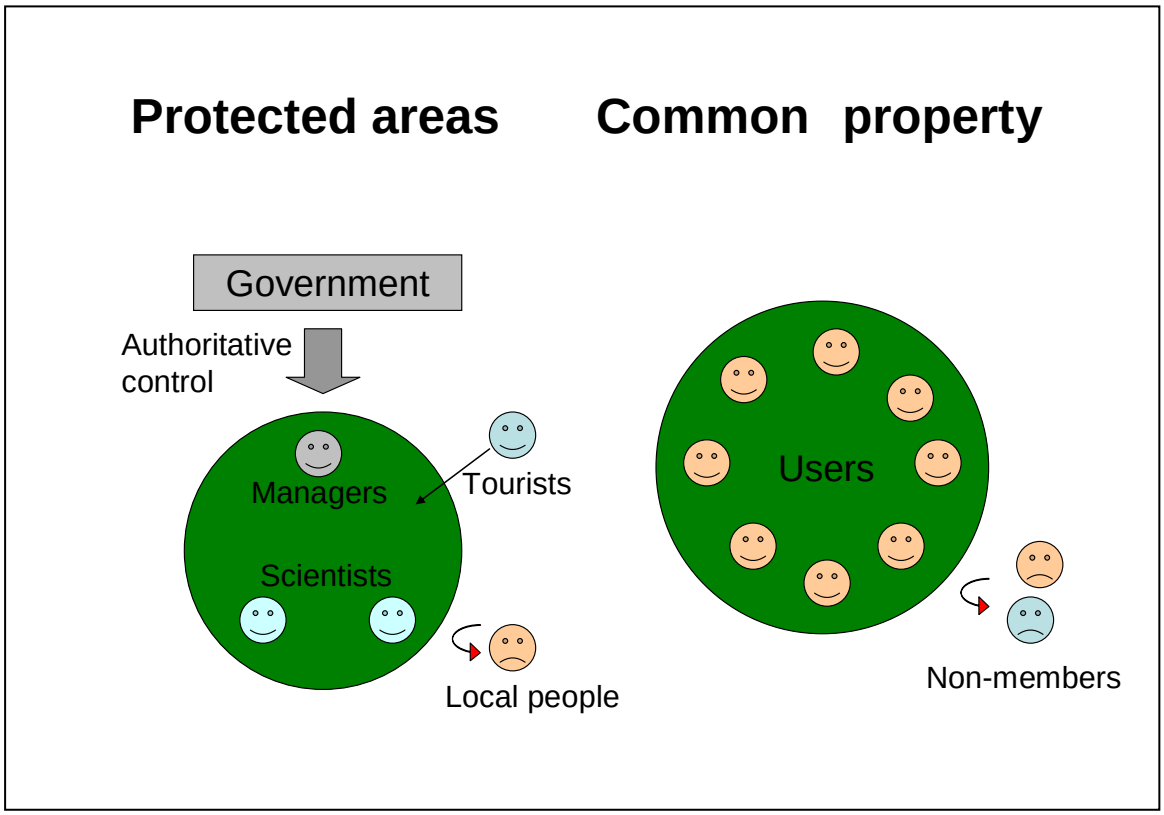
The fifth criterion concerns decision-making processes, which can be linked with two other criteria on the community and the stakeholder relations. Meinzen-Dick and Knox (2001) suggest that the management body should be large enough to overcome the possibility of elite capture. How decisions are made, in my view, matters more than how big a group is. Participatory mechanisms are assumed to increase possibilities that decisions be superior, or at least acceptable, to a majority of the members. Such mechanisms do not always have to be formal. Informal settings can be effective in encouraging collecting voices from a wide range of stakeholders, if the dialogue is facilitated well (Gill 1996). The high level of participation does not guarantee the participants' level of satisfaction regarding the process and outcome (Hunt and Haider 2000). Generally speaking, however, participatory mechanisms for making decisions are assumed to support robust grassroots institutions (Wittayapak and Dearden 1999).

The sixth criterion for CPPAs is property rights and roles held by various stakeholders. It is assumed that an inclusive and nested structure positively supports CPPAs, in which various stakeholders have different types of property rights and play different roles. Structures of stakeholder relationships vary in the three conceptual models of protected areas, common property and CPPA. Figures 10 and 11 illustrate my understanding of the different structures in the representative models of the three. Circles in the diagrams show general strengths of property rights held by different stakeholder groups. A certain set of rights are held by actors inside a circle.

In conventional protected areas (the left-hand side of Figure 10), park managers are placed inside the circle. It means that they can exercise powerful rights such as exclusion as government authorities. Scientists often receive permission to enter the parks and conduct research. They are also placed within the circle. On the other hand, the general public has a limited right in many protected areas. A typical case is that the general public is prohibited to live or extract resources in the protected areas, while temporary visitors are allowed to enter. Some conventional parks have suppressed the property rights of local people partially or entirely. In this sense, they have a closed structure, established by a top-down policy of the government.

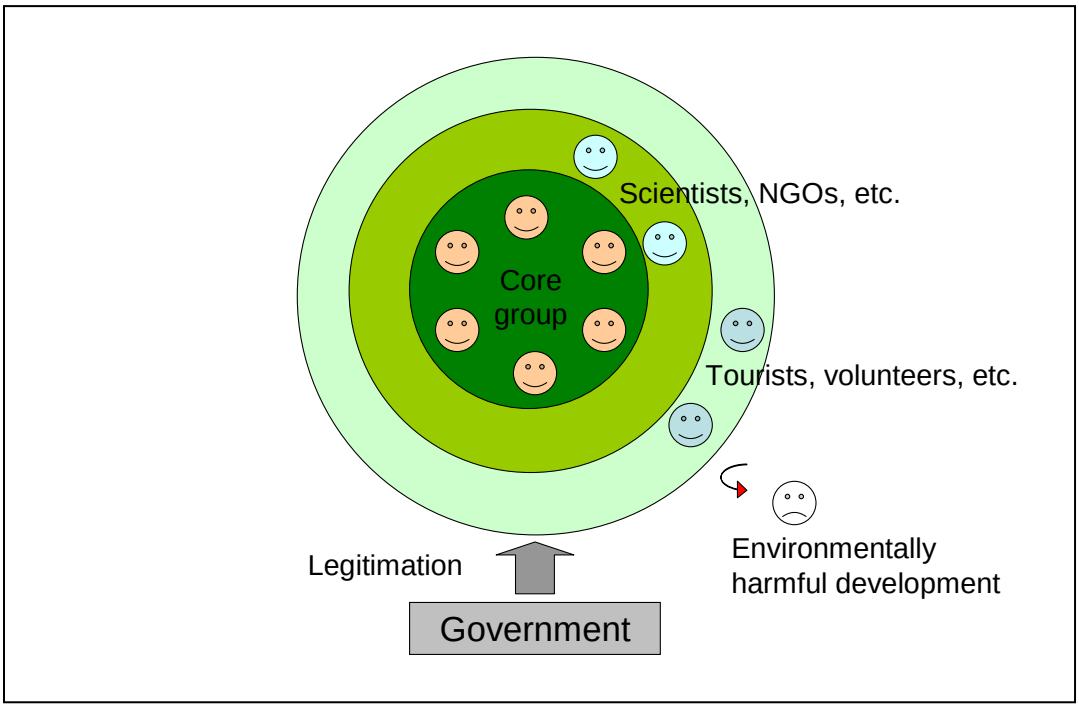
A typical model of traditional institutions under common property (the right-hand side of Figure 10) is even simpler. Control and access are limited to a specific group of people who live in a same region (community). These members have undivided, collective rights to the land and resources, setting their rules of access, use, monitoring and possibly sanctions for disobeying them. Members cooperate with each other to defend their rights against non-members. In old institutions situated in remote locations, it is generally assumed that external stakeholders, such as governments and large industries, have relatively little capacity for intervention. The key here is that there has to be a strong structure with a clearly identified group of local people at the core, whether there is intervention from outside or not. In this sense, common property institutions are also built in a closed model.

Figure 10: Structures of property rights and roles held by stakeholders in conventional protected areas and common property



The CPPA model (Figure 11) differs from both protected areas and common property, although borrowing ingredients from them. It has grassroots (local) control at the core, supported by other stakeholders. Different circles represent the degree of involvement and authority, from strong (core) to supportive (peripheral). Scientists and other interest groups such as NGOs can play a very important role in supporting the grassroots institutions financially and/or technically. Temporary visitors such as tourists and volunteers are acknowledged as stakeholders, although their stakes are generally smaller. Government is placed at the bottom, instead of the top, of the diagram with intention. Its role should be to secure foundation of the institutional structure with legal, financial, technical and other instruments. For example, if laws concerning land property clearly include conservation as a legitimate use of the land, that would protect the owners against squatters claiming property rights by engaging in extractive use (Swift 2004).

Figure 11: Stakeholder structures of common property protected areas



The final criterion is on driving forces for establishing and maintaining CPPAs as institutions. These forces can be economic incentives and/or mental values. There are various types of mechanisms that motivate key stakeholders to pursue the goals expressed in CPPAs. In some cases, norms and values held by individuals or groups play a crucial role. Without effective driving forces, it is unlikely that the goals will be achieved or that the CPPA institution would survive in the long term.

Conclusions

Protected areas, particularly in North America, have been the domain of the state. To mitigate the conventional problems and to gain wider support, protected areas would benefit from extending their boundaries, both spatial and institutional, to non-governmental property regimes. Many scholars researching common property have criticized protected areas of the conventional top-down government type, and have highlighted the relative advantages of common property regimes for resource management. The CPPA concept aims to build positive linkages between common property and protected areas in order to pursue both environmental and socio-economic goals. This chapter proposed a set of assumed preconditions and promoting factors enabling CPPAs to emerge and persist, which could be used for analyzing actual grassroots cases.

Chapter 4: Methods of Empirical Research

Introduction

Earlier chapters set the theoretical basis for grassroots initiatives aimed at nature conservation using common property, calling such an institution common property protected area (CPPA). This chapter explains the methods of empirical research in social science generally, as well as this research specifically. It first reviews basic strategies and approaches that should be considered when designing social science research. They are deductive versus inductive strategies, time frame, case study, and ethnography based on participant observation. Two alternative approaches, participatory action research and participatory learning and action, are also reviewed in order to consider ways in which a researcher and the researched may engage themselves in the process. Then the actual strategies and methods adopted in this dissertation are explained. The chapter concludes with description of the ways to report the case studies.

Basic strategies and approaches

Social research, according to Blaikie (2000), is about answering research questions in three forms: *what* questions for description; *why* questions for causal explanation; and *how* questions for intervention. Research questions can be answered with different strategies. One distinction can be made between deductive and inductive strategies. The deductive strategy tests hypotheses that are derived in advance from theories. Hypotheses are possible answers to 'why' and some 'how' questions, and are often expressed as statements of relationships between two or more variables. The inductive strategy, on the other hand, aims to generalize the findings from one or more case studies. There are other explanations of the research strategies, but the essence is the contrast between "theory first" or "practice first". Both strategies contribute to theoretical advancement. When there are multiple questions within one research project, both strategies can be applied in combination (Blaikie 2000).

Another issue in designing social science research is the time frame, which can be divided into three categories: historical, cross-sectional and longitudinal. Historical studies look into the past, while cross-sectional studies focus on the present, or the time of data collection to be precise. Longitudinal studies cover a certain length of time, and they often pay attention to the change over time, or comparison of *before* and *after* (Blaikie 2000). Various time frames are possible such as: 1) comparison within the past (e.g. between the years 1900 and 1959); 2) past and present (e.g. ten years ago and now); 3) present and future (e.g. now and five years from now); and 4) past and future (e.g. ten years ago and ten years from now). Looking into the future is often done in the form of planning. Environmental impact assessment is another example of the third or fourth category above, as likely impacts are assessed before a project, policy or other type of intervention is actually implemented. The purpose is to provide essential information for decision making beforehand. A comparison between different points in the future (e.g. 2050 and 2100) is possible in the form of prediction, though most research projects make reference to the present or past conditions as the baseline or at least as the background.

While some questions may be answered solely by philosophical reflection, they may be addressed by empirical analysis. The case study is a way to examine situations or practices in the real world, which are relevant to the research questions. In this sense, Yin (2003a; 2003b) insists that the case study is a strategy, not a method, of research, and that case studies can apply various

methods and techniques. Case studies are often used as an inductive strategy, but they can also be deductive by setting hypotheses in advance. Combining deductive and inductive strategies in a single case study is possible, too. There are case studies that demonstrate the limits of theories or models, and possibly propose new elements in order to improve generalization (Castellanet and Jordan 2002). The key is a connection to theory: it is the failure to engage theory, not the fundamental nature of the case study strategy, that attracts criticism (Yin 2003a).

A case study in social science can adopt one or more data collection techniques, such as participant observation, interviews, document search and surveys. Sources of data vary, and include, among others, the field, library and the Internet. Researchers conducting case studies should be capable of understanding issues, asking questions, listening, maintaining flexibility, and eliminating bias (Yin 2003a). The quality of a case study depends on appropriate design and implementation of research, appropriate identification of causal relationships, high repeatability of results in other case studies, and high applicability for general theory, according to Yin (2003a).

One of the methods for documenting case studies in social research is ethnography. It is a method for providing insight into the processes and meanings bound by place, which Herbert (2000) claims should be used more in human geography research. Ethnography normally relies on participant observation by a researcher staying in the field for an extended period. “Ethnography uniquely explores lived experience in all its richness and complexity… These observations and interactions enable the ethnographer to understand how the group develops a skein of relations and cultural constructions that tie it together” (Herbert 2000: 551).

Alternative approaches

One of the two alternative approaches discussed here is the participatory action research, which has gained increasing popularity in education and other social sciences. Participatory action research is a challenge to conventional approaches of research that seek credibility by excluding subjective values. Participatory action research makes several assumptions including the following three, as summarized by Brydon-Miller and others (2003). First, knowledge is socially constructed. Second, any research has values embedded. And third, participatory action research is a process to promote desired societal goals such as democracy, civil rights and social justice.

Participatory action research targets specific people, and often assists their own understandings of limitations as well as potential strengths (Castellanet and Jordan 2002). Thus, it usually aims for improvement based on consciousness, which conventional science considers as unwanted bias (Wadsworth 1998). Biases result from personal values, as well as incentives derived from institutions (Saterson and others 2004), depending on the group or interest with which a researcher is tied.

What distinguishes participatory action research from conventional research is the explicit understanding and inclusion of researchers’ values, goals and positions. Even asking a question is an intervention, for example, which may result in a change in the perception or behavior of a person or a group studied. These people may choose not to change, but this choice can also be considered an action (Wadsworth 1998). Any research involves values of the researcher in terms of selecting questions to ask, people to work with, phenomena to observe, explanations to make, and actions to take. New questions are asked and examined constantly, which can be developed into a new cycle of research process (Wadsworth 1998). As opposed to a linear-style process that ends after findings are analyzed, participatory action research is a cyclic process in which one cycle leads to the next.

Participatory action research has been applied in many fields, including natural resource management. It is also an alternative approach to demonstration projects, many of which are

implemented in a top-down manner based on the implied assumption that the outside experts are superior (Castellanet and Jordan 2002). Applying such techniques as mapping, surveys, interviews and workshops, Chuenpagdee and others (2004) found their participatory research useful in establishing the basis for possible co-management of marine resources in San Felipe, Mexico by various stakeholders, such as fishers, ranchers, tourist boat operators, government officials and scientists. This is an example of research in which participation is a key. It tends to take a long time, however, to plan and conduct participatory research, which is a major drawback (Castellanet and Jordan 2002).

Another alternative approach to conventional scientific research is participatory learning and action, which has been advanced particularly in the field of international development. It is possible to trace the change during the past three decades regarding the attitudes and roles of people coming from outside to project sites. Conventionally, outside experts carried out questionnaire-based surveys in their brief visits to assess socio-economic situations and local livelihood strategies, such as agriculture, forestry and fisheries. Formal surveys in general are also costly and time-consuming, often not proportionate with utility of the outcome (Chambers 1994a). In response, rapid rural appraisal emerged in the late 1970s as an alternative approach.

> In it [rapid rural appraisal], a multidisciplinary team makes use of simple, non-standard methods and the knowledge of local people to quickly elicit, analyze and evaluate information and hypotheses about rural life and rural resources that are of relevance for taking action. RRA [rapid rural appraisal] techniques are an attractive alternative to conventional survey methods when the aim is not to systematically capture precise figures, a typically time-consuming and cost intensive undertaking, but rather speedy and action-oriented assessment of local knowledge, needs and potentials with an aim to elaborating strategies to resolve conflicts or investigate specific problems. They are also suitable for shifting the focus of conventional surveys onto essential aspects (Schönhuth and Kievelitz 1994: IX).

Rapid rural appraisal gained popularity over time, and was gradually considered credible (Grandstaff and Messerschmidt 1995; Takasaki and others 2000). However, it was still a way of extracting information by outsiders, which could fail to fully capture the local realities. Local people would feel little ownership of the findings in this way, too. These shortcomings resulted in a stronger emphasis on the local people's participation, enabled by a newer approach known as participatory rural appraisal. It is defined as "a family of approaches and methods to enable rural people to share, enhance, and analyze their knowledge of life and conditions, to plan and to act" (Chambers 1994a, 953). Techniques or tools in participatory rural appraisal include transect walks, social/community mapping, stakeholder analysis (e.g. Venn diagrams), semi-structured interviewing, focus group, matrix scoring, seasonal calendar, daily schedule, past and present (or present and future) drawing, historical timelines, and flowcharts. These methods usually involve visual presentation to facilitate expression and communication among different stakeholders who may not use the same language. Even illiterate people can easily participate in the activities. In participatory rural appraisal, once rapport is established, outsiders are expected to act as facilitators so that the local people themselves can gather, analyze and own the data. The shift from outsiders' dominance to local people's spontaneity is described as "handing over the stick" (Chambers 1994b, 1255), which characterizes the essence of participatory rural appraisal. Development practitioners have been the main users of participatory rural appraisal, and many guiding and training materials have been published (e.g. OESP 1997; Evans and others 2006a; 2006b).

Partly because it spread so rapidly, participatory rural appraisal produced not only positive but also negative results. Mosse (2001) explains the pitfalls of participatory rural appraisal in four mutually related dimensions: 1) local knowledge is formulated and manipulated largely by external

and internal politics and bureaucracy, although it is supposed to come from the local villagers to reflect real needs in the projects; 2) donor organizations bring their strategic priorities in project sites, while villagers modify their priorities to secure implementation of the project, resulting in a set of needs that suit involved organizations' broader priorities and administrative requirements; 3) participatory rural appraisal is used to visualize and legitimize those distorted project objectives; and 4) this kind of manipulation is often done unintentionally or even without being noticed by those involved in the process.

These pitfalls are not necessarily embedded in the concepts or techniques. Failure in participatory rural appraisal often results from inappropriate implementation. For example, there are studies labeling themselves as participatory rural appraisal, but some of them merely use pre-designed techniques familiar to the researchers, without seeking more appropriate approaches and techniques at the sites (Chambers 1994c). If not adaptive, participatory rural appraisal cannot be an alternative to address the problems in the more conventional style of social science.

Lessons learned in rapid rural appraisal and participatory rural appraisal are the basis of a broader concept called participatory learning and action. It places stronger emphasis on empowerment and behavioral change, and has increasingly been referred to as a concept that can be applied beyond the contexts of international development (Abbot 1999; Chambers 2002; Pelling 2007). Proponents of these alternative approaches share one claim: trustworthy findings do not necessarily have to be generated by measurement, statistical analysis and repeatability. This challenges the conventional value of scientific rigor, particularly when exploring the complexity of the real world (Chambers 1994b, 1261).

Ambiguity of the word participation should be noted. Participant observation, participatory action research and participatory learning and action claim to be participatory. However, it is not explicitly clear whose participation they seek to obtain. In participant observation, it is the researcher that participates in activities carried out in the case setting. It is a means to a better understanding of what is happening and a stronger rapport with the informants. In participatory action research, it is also the researcher that participates in action for change, based on his/her values. On the other hand, the primary subject of participation in participatory learning and action is the subject of the research, such as villagers in rural development and students in education. It means that those people should take part in the assessment, planning, and possibly action for change, instead of being passive objects of intervention. These participatory concepts and methods are usually inclusive, meaning that they encourage participation of diverse stakeholders. Inferring the different emphases in these approaches, however, is a way to understand the contexts behind them. This ultimately leads to a question of how a researcher intervenes.

Fieldwork

Research in geography, both physical and human, frequently involves fieldwork. Stan Stevens, a human geographer who has long conducted research in Nepal, advocates the virtue of fieldwork passionately:

> To me, fieldwork is the heart of geography. I consider it the most magical, essential, and challenging part of being a geographer. Fieldwork is the ultimate mode of geographical exploration. It renews and deepens our direct experience of the planet and its diversity of lands, life and cultures, immeasurably enriching the understanding of the world that is geography's core pursuit and responsibility. Fieldwork takes us beyond current frontiers of knowledge and preconception, enabling firsthand discoveries that no amount of theorizing or study of preexisting accounts or maps could ever reveal (2001, 66).

The keys to achieving this ideal outcome, according to Stevens, are commitment and reciprocity. Researchers must accept academic and ethical responsibilities. Research should be beneficial for both researchers and the subjects/informants of the research.

The common notion of fieldwork as research in a location distant from home and in a specific time is arguable. Hyndman (2001) demonstrates her own experience related to the fieldwork on refugees in Kenya. Hyndman assisted some of them to migrate to Canada during her seven-month fieldwork. Shortly after returning to her home in Vancouver, Canada, Hyndman learned with much surprise that one of those refugees was in Vancouver to seek further assistance from her. “The field came home,” as Hyndman (2001, 270) recalls. This is apparently an extreme case, but it shows that spatial and temporal boundaries of fieldwork are not as distinctive and isolated from daily life at home as often perceived to be.

Coursework at the university and practical training programs in Costa Rica and Canada helped equip me with concepts and techniques necessary for the fieldwork. Spanish, the language used in Costa Rica, was also studied to enable communication, although the key informants in Costa Rica spoke English well.

Strategies and methods adopted in this research

This section describes the strategies and methods actually adopted. This research borrowed ideas from both deductive and inductive strategies, in linking theory with case studies. Chapter 3 established a theoretical foundation, including several criteria presumably important for CPPA, although no strict indicators were set for testing. This enables a combination of deductive and inductive strategies, adaptive enough for new criteria to be added in the course of the observation. Regarding the time frame setting, my case studies basically examined the present (the time of fieldwork), with some consideration of the past history leading up to the present, as well as the future to come.

My case studies consisted of two levels. One was the national-level study of conservation policy and initiatives in Costa Rica. The other was the examination of two grassroots nature reserves within Costa Rica. The national-level study was broader in geographic scale, and provided background and context to the latter. One of the grassroots cases was a community-based forest reserve in Talamanca, a remote county in the southeast of Costa Rica, as a case study of the CPPA concept. The other was an individually owned forest reserve in San Carlos, also a remote county in northern Costa Rica. The purpose of studying the two cases was to compare CPPA with an individual property institution.

I conducted two sessions of fieldwork in Costa Rica for a total period of 18 weeks. The first session was for 12 weeks starting mid-January, 2004, and the second was for six weeks from late June of the same year. During these periods, data were collected by participant observation, document search, and semi-structured interviews. For the field research, I stayed in the Talamanca site for the entire month of March 2004, and made a three-day visit for a follow-up in July of the same year. I stayed in the San Carlos site for five weeks starting in January through February 2004, and made another brief visit in July of the same year. I stayed as a volunteer worker in both sites. In addition, I made a couple of three-day visits to see other examples of non-public forest reserves in Costa Rica. One of them was a university called EARTH (Escuela de Agricultura para la Region Tropical Humeda), which owns its own forest reserve, and also coordinates the national network of private reserves. The other location is a community-based forest reserve in Nicoya Peninsula in northwestern Costa Rica. I stayed there as a volunteer as well to receive food and accommodation at a reasonable rate. Other activities included visits to universities (University for Peace, University of Costa Rica, and the National University), the national government (Ministry of Environment and

Energy, the National System of Protected Areas, and the National Forest Financing Fund), local associations and conservation NGOs.

During the stay in Costa Rica, I interviewed twenty-seven people from the organizations mentioned above and in the sites of in-depth case studies. Several Interviewees were contacted more than once for clarification and updates (Appendix 2). I informed beforehand all interviewees and key informants, including the staff and other local people in the study sites, of my research objectives. Most of the interviews were carried out in casual settings. While key questions were prepared in advance (Appendix 1), some responses led to questions not originally planned. I took notes during the interviews, but did not tape-record them in order to create and maintain the casual atmosphere. In order to protect the privacy of the interviewees, they are kept anonymous in the thesis. I also collected relevant documents such as brochures and locally produced tourist guides, although there were not many data sources available for site-specific cases.

Staying in the sites as a volunteer had two major advantages. The first was a practical advantage in terms of the budget. Both of my stays in the rural locations were made possible because I was offered free accommodation and foods in exchange for labor. The second advantage was the efficiency and effectiveness in obtaining the insiders' views. Although a stay for four to five weeks in each site was not necessarily long for in-depth social research, my position as a volunteer helped reduce the time necessary to get to know the settings and develop relationships with participants. It also provided me with a better position than otherwise for participant observation as a result of a relatively smooth immersion with the local people. If I were not a volunteer, it would have taken more time to penetrate into the circle of local people.

My field research was not rapid rural appraisal, participatory rural appraisal, or participatory learning and action in the exact sense. I was equipped with the techniques or a "tool box" for participatory evaluation. And the principles learned from the participatory methods were useful. My best judgment as to how to interact with the local people and what techniques to use or not to use, however, was not to impose participatory techniques just for the sake of my research. My decision had two reasons. One is that the people in the communities were always busy with their daily activities, and this was a matter of subsistence. No work, no life. The other reason is that the people were already undertaking several initiatives to improve the natural environment as well as their well-being. Handing over the stick is a key in participatory research methods, which acknowledges authority, ownership and capacity of non-expert participants. In the sites of my case studies, the people already had the stick.

This decision made participant observation the core of my fieldwork. As Hyndman (2001, 268) puts it, "how and when not to ask questions" was important, and "listening and probing proved more insightful than any of the interview schedules... By engaging with people on their terms, doors were opened and invitations extended". Ethnographic and participatory approaches could enable research and other interventions with outcomes easier for place-bound, core target people to accept, particularly in projects like rural adaptation to climate change (Rancoli 2006).

Spanish was the main language in Costa Rica, although several key informants spoke English. Language was an issue of concern, as my proficiency in Spanish was limited at an intermediate level. I was able to communicate well enough with informants, most of whom were patient with my spoken Spanish and also my asking for clarification of what they meant. I should admit, however, that not all casual conversations between local people were fully understood, limiting some observations. Perhaps the most important limitation is the small number of cases studied. It should be note that findings from these cases alone might not be fully applicable to general theory.

Reporting the findings

Since different stakeholders conduct evaluation for different purposes through different criteria, evaluation approaches naturally vary, and perfectly objective evaluation does not exist. What researchers need to do is to give a clear description of methods and criteria so that analysis of a large number of cases, or meta-analysis, becomes more reliable (Conley and Moote 2003). An increasing number of community-based or collaborative resource management initiatives have been evaluated (e.g. Kellert and others 2000), although it remains a challenge to collect voices from all stakeholders. It is not realistically possible for any researcher to be perfectly objective, and the perceptions of some interests might not be elicited either intentionally or unintentionally. It is still possible to minimize these inevitable biases by expressing the contexts and recognizing the uniqueness of each case (Sato 2003; Stern and others 2002).

This leads to the question of how to analyze multiple cases studied in one research project. There are two main ways to do so. One is to write each case separately in order to provide rich narratives that are specific to respective cases. This is consistent with the concept of “thick description” (Geertz 1973). The other way is to write about all the cases together, based on specific questions or variables set in advance. This is an effective way when making comparison across the cases (Yin 2003a). This thesis first presents the national environmental and regulatory context, then reports each case individually and separately, and finally discusses them together comparatively. Chapter 5 looks at conservation policy in Costa Rica. This not only gives general background to the two specific cases that follow, but also highlights the role of senior institutions such as the national government. Regarding the two specific cases, Chapter 6 reports the community-based forest reserve in Talamanca, and Chapter 7 reports the individually owned forest reserve in San Carlos. Reporting the two cases respectively allows for descriptive narratives and contexts, borrowing a style of ethnography. Some of those narratives might not contribute directly to the analysis of causal mechanisms, but they help to provide a better picture of people, culture, the environment, and the interactions between people and the researcher. Informants’ names are changed to maintain confidentiality.

In order to connect back to theory and also to make comparisons between the cases, Chapter 8 discusses critical issues such as property rights, incentives for conservation, and other factors to influence grassroots conservation initiatives. It refers to both cases as well as to conservation instruments in Costa Rica. My approach is to provide the case-specific contexts as well as possible, and to maintain a cautious position against exceedingly ambitious generalization from the few cases I studied, while attempting the feedback to theory.

Chapter 5: Forest Conservation in Costa Rica

Introduction

Costa Rica is internationally renowned for its progressive conservation policy. One indication is that approximately a quarter of Costa Rica's land territory has been officially protected, roughly twice the rate of terrestrial protected areas worldwide (Chape and others 2003; SINAC-MINAE 2003). Costa Rica is one of the most popular ecotourist destinations in the world, attracting many visitors from abroad, particularly from North America and Europe (ICT n.d.). Natural landscapes and biodiversity, supported by other factors such as peace, political stability, high levels of education, and hospitable people characterize the country's positive side. The system of protected areas in Costa Rican forests, however, has a relatively short history starting from the 1970s. Costa Rica's conservation policy is built on the history of rapid deforestation in the middle of the twentieth century, clearing natural forests for productive activities such as logging, growing coffee, bananas and livestock (de Camino and others 2000).

This chapter studies initiatives and mechanisms for forest conservation implemented in Costa Rica, as a country-level case of experience in pursuing nature conservation and sustainable development. The chapter provides an overview of Costa Rica's green development history that began after a past trend with rapid deforestation. It describes various mechanisms and incentives adopted for forest conservation, both on land owned by the government as well as lands owned by communities and individuals. Finally, it discusses what is special in Costa Rica's forest conservation, as well as the lessons learned. The chapter concludes by reviewing a debate as to whether Costa Rica is a model for other countries.

Costa Rica's society, economy and forest management

The Republic of Costa Rica is located in Central America between Nicaragua and Panama. Its total territory is 51,100 square kilometers. The national census conducted in the year 2000 calculated its total population as 3,810,179 (INEC n.d.). Costa Rica is divided into seven provinces (*provincias*). Unlike Canadian provinces, those in Costa Rica are geographical units without legislative authority. Within each province are counties (*cantones*), which are local units administered by municipalities (*municipalidades*). Municipalities are local assemblies comprising elected members. Under each county are districts (*distritos*), which are divided into towns and villages. Towns and villages are commonly referred to as communities (*communidades*).

A major turning point in Costa Rica's modern history was a democratic revolution in 1948 led by Jose Figueres. Upon the revolution, Costa Rica abandoned its army, and has since enjoyed a high level of peace and political stability (Berntzen 1993). This makes Costa Rica exceptional in Latin America, a region where conflicts among and within nations have long prevailed. Therefore, the government of Costa Rica has been able to prioritize social services, including education, and allocate its budget to these services, rather than military expenses. For his strong leadership and efforts in building peace in Central America, Costa Rica's then President Oscar Arias was awarded the Nobel Peace Prize in 1987 (Sun 1988). The high priority of peace, education and other social services in Costa Rica has tangible outcomes. Costa Ricans' life expectancy at birth was estimated in 2008 at 77.4 years, and the literacy rate of the whole population of the age 15 and older was 94.9% (Central Intelligence Agency n.d.). Thanks to these favorable characteristics, some call Costa Rica the "Switzerland of Central America."

Costa Rica's gross national income per capita in 2004 was estimated at US$4,670 (World Bank n.d.). Major industries of Costa Rica are tourism, coffee and banana. Tourism has been the country's fastest growing sector, owing much to ecotourism since the 1980s. In the late 1990s, over US$2.5 million of annual revenue was generated from tourism, surpassing the exports of banana and coffee (Rodriguez 1997). In terms of forest conservation, ecotourism is generally preferable than agricultural development resulting in forest clearing. Costa Rica is one of the pioneering countries that turned nature conservation from a hindrance to an important means of economic development. This is discussed later in more detail.

Costa Rica's territory is a mere 0.3% of the earth's surface (Central Intelligence Agency n.d.). Yet, this small country hosts a wealth of fauna and flora; approximately 5% of all the living species on earth are said to be present in the country (Obando 2002). Costa Rica's fame as a model nation pursuing its policy toward nature conservation and sustainable development was not gained overnight, however. Costa Rica experienced rapid and massive deforestation in the twentieth century, most notably during the 1960s and 1970s (Kleinn and others 2002). Many areas with heavy precipitation, steep slopes, and poor soil quantity, where forests should be kept, were cleared. This occurred partly because the forest values as natural capital were not connected with the national accounting system (Solorzano and others 1991). Policies favoring economic development by land conversion from natural forests to extractive uses were thus prioritized (Jones 1992).

Evans (1999), in his comprehensive history of Costa Rica's conservation policy, divides the history of interactions between people and forests into three stages following the pre-Columbian times. Before Spanish colonization began in the sixteenth century, native people's active intervention with forests was limited to small-scale burning. Even after the Spanish settlers arrived, the scale of forest loss remained relatively small, as the region's formidable topography discouraged land development. A first wave of deforestation in Costa Rica began in the late 1830s with coffee plantations. Volcanic soil and the temperate climate at higher elevations made the central valley a suitable location for coffee production. Most farms were family-owned and small-scale. A second wave of deforestation came during the last few decades in the nineteenth century with banana plantations, mostly in the Caribbean lowlands where precipitation is abundant. Labor intensive production of bananas meant an increasing population to feed, resulting in more clearing of forests for crop farms and ranches. This became a third wave of deforestation. Cattle farms expanded over time, most remarkably in the 1960s and 70s due to the demand from fast food industries in the United States. Lumber industry is also responsible for deforestation as its extraction of tropical wood more than doubled between the 1950s and 1980s with construction of roads in formerly inaccessible locations (Evans 1999).

After the 1948 revolution, Costa Rica began a land reform program, which had significant impacts on forests. The new government established the Costa Rican Institute of Electricity (*Instituto Costarricense de Electricidad*) to manage major watersheds for hydropower generation. Ministry of Agriculture and Livestock (*Ministerio de Agricultura y Ganaderia*) established a new section to manage forest resources in 1949, and it remained responsible for the country's forests until the mid-1990s (Evans 1999). The Costa Rican Institute of Tourism (*Instituto Costarricense de Turismo*) was established in 1955, and one of its missions was to develop a national park plan. The Institute on Lands and Colonization (*Instituto de Tierras y Colonizacion*) was established in 1961 to mainly grant formal land tenure to those who had been settled, and to encourage them to develop their land for growing crops and livestock. As might have been the case in many other parts of the world at that time, forests were regarded as obstacles to economic development in Costa Rica. Land "improvement" (*mejoramiento*) was legally demonstrated in many places as a policy, as well

as practiced by poor settlers without government recognition elsewhere, accelerating deforestation (Evans 1999).

One study indicates that 15.3% of Costa Rica's land territory was converted from forests to pastures or crop fields between 1979 and 1992, while 2.6% of combined pastures and crop fields shifted to secondary forests; this makes the net loss of forests in this period 12.7% of the entire territory (IMN, MINAE and UNEP 1996, cited in de Camino and others 2000). This includes the natural forests (322,515 ha) converted to pasture during this period, accounting for 6.3% of the country's land territory. Many data sets have been published on forest cover in Costa Rica with different figures, as an inevitable result of varying purposes, definitions, data sources and analytical techniques. The trend commonly seen in most studies is a decline of forest cover in Costa Rica in the twentieth century, most notably in the 1960s and 1970s, although the total amount of forest cover reached its lowest level in the late 1980s through the 1990s (Kleinn and others 2002). A more recent trend shows a modest growth in Costa Rica's forest cover, assumedly because the uses of forest have been diversified and conservation has become an important goal (de Camino and others 2000; Segura-Bonilla 2003). Ecotourism has also contributed to the conservation of Costa Rican forests (Kull and others 2007).

Costa Rica has provided attractive fieldwork sites for scientists, especially those studying tropical biology. Encouraged by political stability and peace, research activities have been carried out in Costa Rica by international and domestic scientists. Leslie Holdridge's (1947; 1967) defined and classified "life zones" for ecological research as well as land use decisions in Costa Rica and elsewhere (Ewel 1999). Based on a simple data set of temperature and rainfall, the life zones classify ecosystem types. Development of this classification owed largely to Holdridge's long-term research in Costa Rica.

A consortium of universities and research organizations was established in 1963, called the Organization of Tropical Studies, which has hosted tropical science researchers from the United States, Costa Rica and other countries in its three biological stations (reserves) in Costa Rica, including its first reserve in La Selva, acquired from Leslie Holdridge and later expanded to connect with Braulio Carrillo National Park (Evans 1999; Laarman and Perdue 1989).

Development of the protected area system

While the development of land-based conservation in Costa Rica is an outcome of its long history, the 1960s can be singled out as a turning point. Witnessing the uncontrolled squatting and deforestation near his settlement in the Nicoya Peninsula, the north-western part of the country, Swedish retiree Olof Wessberg negotiated with the Costa Rican authorities and international conservation organizations from the late 1950s, leading to the establishment in 1965 of a nature reserve called Cabo Blanco. This reserve became the first forest officially protected in the country, because the two national parks established earlier in Poas and Irazu encompassed only volcanoes (Evans 1999).

Another individual whose effort led to the development of protected areas in Costa Rica is Daniel Janzen. While teaching biology at University of Pennsylvania, Janzen worked for decades to experiment and formally institutionalize new mechanisms for conservation in Guanacaste, the northwestern region of Costa Rica. Guanacaste's lowland dry forests had been degraded and downsized due to natural and human-induced fires and intensive uses of land as pastures and crop farms. Janzen purchased parcels of land from local owners, and negotiated with the government for national park designation. This led to the establishment of Guanacaste Conservation Area, which began the creation of a nation-wide system of conservation areas (discussed below). Janzen was also an early leader in using ecological functions as financial sources for conservation by seeking

contracts with non-governmental sectors, instead of being totally dependant on the government (Daily and Ellison 2002; Janzen 2001).

Another characteristic of Janzen's approach was to work together with local people (Honey 1999). Administration of the Guanacaste Conservation Area brought employment opportunities for local people. Management decisions are made by the board of directors and assembly comprising local members. Perhaps the most unique instance is that local people having acquired ecological knowledge informally are trained formally to become "parataxonomists", who contribute to biological research in collecting and identifying species present in the area (Daily and Ellison 2002; Janzen 2001).

The National System of Conservation Areas was established in 1998, as a subsection of the Ministry of Natural Resources, Energy and Mines (later reorganized as the Ministry of Environment and Energy). This was also a system of dividing the country's entire territory into eleven Conservation Areas. Each Conservation Area covers all of the territory within its boundaries land, just like another way of dividing the country into provinces. This distinguishes the Conservation Areas from protected areas in general, although there are many protected areas designated within the Conservation Areas. Unlike provinces, Conservation Areas were divided on the basis of geographical characteristics, which the Costa Rican government assumed suitable for its decentralizing policy on conservation. The office of each Conservation Area is responsible for the management of all officially protected areas Within the Conservation Area. The headquarters office of the National System is placed under the Ministry of Environment and Energy, overseeing the nation-wide coordination of conservation areas.

There are eight categories of protected areas included in the National System of Conservation Areas (Table 4). There are 155 protected areas occupying approximately 1.3 million hectares or 25% of the national land territory (SINAC-MINAE 2003).

Table 4: Types of protected areas in Costa Rica

Costa Rican category	Equivalent IUCN category
Absolute natural reserve	I. Strict natural reserve / wilderness area
Biological reserve	I. Strict natural reserve / wilderness area
National park	II. National park
Natural monument	III. Natural monument
National wildlife refuge	IV. Habitat/species management area
Wetland	IV. Habitat/species management area
Forest reserve	IV. Habitat/species management area
Protected zone	V. Managed resource protected area

Source: Adapted from Garcia (2002)

Problems in the protected area system

The system of protected areas is important for forest conservation, but it is not a perfect policy tool. The rapid expansion of protected areas generated conflicts between the government and local communities. Cahuita National Park, designated in 1982 in the southeast of Costa Rica, was an early example of a protected area with severe conflict between conservation interests and local

communities. Walter Ferguson, a singer-songwriter of Calypso, the music typical in the Talamanca region, sings in the song entitled *National Park*:

> National parkers are going around
> Into my farm they seat and walk
> Telling everybody all around the town:
> This is National Park.
> They want to get full details.
> How long I owned this piece of land?
> No tell no lie or you going to jail!
> That's what they made me to understand [as originally worded]

Livelihood activities of people in Cahuita, such as extraction of marine resources, were prohibited by the government upon national park designation, and there was no compensation initially. Even after economic compensation was offered, there was refusal in the villagers' side because they preferred to keep their ways of life. Cooperative measures were later introduced, including: concessions granted by the government to the local people for subsistence fishing; prioritized employment of park staff from local people; and agreement between the government and local people on consultation for important decision-making. The park designation encouraged tourism, gradually generating economic opportunities for the local community (Rodriguez 1997).

Another conflict occurred in the area covering two communities of Gandoca and Manzanillo on the Caribbean coast, about ten kilometers south from Cahuita. Initiatives by a non-governmental organization based in Costa Rica called ANAI with support from the World Wildlife Fund led to the designation of a wildlife refuge in 1985 in the area connecting two remote communities of Gandoca and Manzanillo (Anger 1989). There was opposition from local communities, especially in Manzanillo, a small village with about twenty-five households, composed mainly of Afro-Caribbean people whose ancestors migrated to the region by the early twentieth century. As opposed to Gandoca, where residents were mainly Spanish descent moving from other parts of the country in the past several decades, people in Manzanillo had a longer history of living in their way of life and managing natural resources sustainably. The wildlife refuge designation came as a surprise from outside to the local people, pursuing goals set by the former rather than the latter (Anger 1989).

Another problem is isolation and fragmentation of protected areas. At the national scale, two of the ten life zones that include forests, namely *tropical moist forest* and *premontane moist forest*, have faced severe deforestation and fragmentation (Sanchez-Azofeifa and others 2001). The forest cover within national parks and biological reserves, the strictest categories oriented toward conservation, was stable between 1960 and 1997; the forest cover in the areas immediately around these protected areas (within one kilometer from the boundaries) increased in the period between 1987 and 1997. On the other hand, when extending the assessment to areas within ten kilometers from the boundaries, significant clearing around national parks was observed, particularly such parks as Corcovado, Braulio Carrillo and Tortuguero (Sanchez-Azofeifa and others 2003). The case of Corcovado National Park shows its isolation from surrounding areas. Located on the Osa Peninsula in southwestern Costa Rica, it is the only protected area in the country representing *tropical wet forests* as classified by Holdridge (1967). The forest cover in the Osa Peninsula fell from 97% in 1979 to 89% in 1997, because forests outside of the national park were cleared extensively (Sanchez-Azofeifa and others 2002). Conservation on lands not owned by the government, therefore, is an important issue.

Conservation in non-governmental territories

Before starting this topic, terminology should be clarified. As explained in Chapter 1, the classification of property regimes adopted in this research comprises: government property;

individual property; group property, including common property where members are from a single local community; and open access. In reviewing the literature on non-governmental areas for conservation in Costa Rica and elsewhere, I often encountered the term “private reserve.” This term refers to various types of non-governmental property, which might be a description too coarse and possibly confusing. More precise terminology can help the discussion.

Each of those private reserves can be sorted into either individual property or group property, or common property if the group is a local community. Looking more carefully, it appears appropriate to have one additional category. A large corporation or organization with a broad range of members or shareholders beyond the local community might better be described as organizational property. Such an organization can be seen as a single legal entity, so that its land could be described as individual property. It is also possible to see the organization as a group made up with multiple members sharing undivided rights as group property. Distinction can be made depending on the structure of each organization in question. A family business, a small company with only a few employees, and a small non-profit organization with a leader and only a few supporting people are examples of an extended type of individual property rather than organizational property as I define it. An organization with equally active roles played by a majority of its members would fit better with group property rather than organizational property. Although such distinctions might not be easy in all real cases, clarification at the conceptual level would assist a deeper understanding of varying types of non-governmental property.

Based on the above reflection, more finely sorted categories of nature reserves (not including open access) are: 1) government property (e.g. national parks), 2) individual property (owned by one person or one small and tight unit like a family), 3) group property (owned by a group of people sharing undivided rights and active roles), 4) common property (owned by a single local community), and 5) organizational property (owned by a large NGO, university, etc.). This finer classification I assume is useful in examining reserves managed in various property types, because each has its distinct characteristics. Organizational property was created because this type of reserves appeared to have a larger scale and a more robust support in terms of legitimacy, budget and human resources, than other types of non-governmental property.

A study by Langholz and Lassoie (2001) estimates that there are about 250 non-governmental nature reserves in Costa Rica, covering over one percent of the country’s land territory. They protect important ecosystems, particularly primary forest (60.4% of the total area studied), and contribute to the connectivity of protected areas. Two-thirds of the studied reserves are owned by individuals or families, 20% by corporations (typically larger lodges), and 12% by non-profit organizations and universities. Fifty-two per cent of the studied reserves are owned exclusively by Costa Ricans, 27% exclusively by foreigners, and 22% by partnerships of foreigners and Costa Ricans. Personal enjoyment (84%) is reported as the top motivation for creating and maintaining a non-governmental reserve. The second motivation is to develop an ecotourism business (60%). These figures indicate that personal values are generally a stronger motivation than economic return. The following describes several examples of conservation on lands outside government property: Monteverde as a major example of grassroots conservation in Costa Rica; El Rodeo as an example with three property types mixed; a national network of private reserves as a collective initiative; and a national wildlife refuge as a policy tool to extend the system of protected areas into lands not owned by the government.

It is fair to say forest conservation in Costa Rica began in the non-governmental sector, prior to the government’s direct involvement. Monteverde, located in the north-central highlands of Costa Rica, is frequently mentioned as the pioneer of non-governmental forest reserves. There are three units of non-governmental forest reserves in the area: Monteverde Cloud Forest Reserve (10,500

ha), Children's Eternal Rain Forest (22,000 ha) and Santa Elena Cloud Forest Reserve (310 ha) (SINAC-MINAE 2003; Weinberg and others 2002).

Early settlers in Monteverde began to arrive in the 1920s from Costa Rica's central valley, and Quakers from the United States also moved there at the end of the 1940s (Moragrega 2004). These immigrants lived on subsistence agriculture, as well as dairy products after building a cheese factory in 1953 to operate as a cooperative (Baez 1996). They decided without outside encouragement to keep over 554 hectares of forest intact for watershed protection. Scientists began to visit Monteverde, finding it a suitable site for their research (Baez 1996). George Powell, a U.S. biologist, played an important role in persuading a non-governmental organization to acquire land and establish a forest reserve in Monteverde in 1972. This organization was the Tropical Science Center founded in 1962 by scientists from the U.S. (Evans 1999). The reserve has been enlarged in several phases, and together with the two other reserves, Monteverde now protects over 30,000 hectares of forest (Newcomer 1999; Weinberg and others 2002).

The downside of Monteverde is seen in a number of socio-economic and environmental problems. A rapid change began with the ecotourism boom in the end of the 1980s. Local workforce has moved to tourism jobs, and yet more workers were hired from outside, accelerating the population growth in Monteverde. Negative impacts were found in increased solid waste, pollution, uncoordinated development of infrastructure, landscape degradation, and use of drugs (Moragrega 2004; Weinberg and others 2002). Another problem more peculiar to a community heavily dependent on tourism is seasonal unemployment. The wet season from May to November attracts fewer tourists, resulting in decreased opportunities for employment. Possibly the most severe problem is the decline of local control in decision-making, as the growth of ecotourism resulted in an increasing interest and influence from outside groups such as the tourism sector (Weinberg and others 2002). In both positive and negative ways, Monteverde is a remarkable example of early grassroots institutions in the non-governmental sector aimed at conservation and local development (Miranda 2003).

Another example of forest reserves on lands not owned by the government is El Rodeo, nearly 2,000 hectares of forest surrounding the University for Peace, an institution affiliated with the United Nations for higher education in peace-related studies. This reserve used to belong to an individual farmer until its management was transferred to the University through the government in the 1980s, facilitating the use of this forest for scientific research (University for Peace 1995). Partly due to the proximity of the reserve to the city of Colon, as well as to the national capital of San Jose, tourism is a major activity in the area (Aguilar 1999). There are local communities around the area, one of which is an indigenous group, and these groups' participation in the reserve management is increasing, according to my personal communication in 2003 through 2004 with Gerardo Budowski of the University for Peace. This is a unique case of forest conservation combining three property arrangements that do not belong to the government: individual, organizational and common. Organizational property in particular provides a strong institutional backbone for the continued management of this reserve.

As the number of non-governmental initiatives to protect forests in Costa Rica grew, a group of owners formed the Costa Rica Network of Private Nature Reserves in 1995, covering a total of approximately 60,000 hectares in over a hundred locations (Rainforest Alliance n.d.). Reserves participating in the Network are lands owned either by individual persons, groups including local communities, or large organizations, but not by the government. The Network does not include all of the non-governmental reserves in the country, but it has grown to be a large collective body representing the owners' interests. It provides its members with technical support as well as advice on financing.

Policy has also approached lands not owned by the government. One scheme designed to integrate non-governmental property into the system of protected areas is the National Wildlife Refuge. The category of wildlife refuge in Costa Rica covers both governmental and non-governmental territories. As a formal category backed by law, the government decides whether or not to designate an area as a wildlife refuge. The land owner of a wildlife refuge must draft a management plan and receive approval of it from the government, which would restrict the land use. In exchange, the owner receives three incentives: tax exemption, technical assistance for management, and assistance in solving squatter problems if any are present (Langholz and others 2000). There are other indirect incentives for land owners to obtain a status of national wildlife refuge, such as publicity effects that are useful in promoting ecotourism. This category of protected areas has higher potential than was initially assumed, as a way to extend the concept and actual sites of protected areas beyond government property (Langholz and others 2000). This scheme helps connect each of the sites into a broader landscape aimed at conservation encompassing lands managed as government as well as other properties.

Carrot and stick for forest conservation

Costa Rica amended its forestry law in 1996 with the aim of prohibiting conversion of any natural forest, which is a highly restrictive regulation. Enforcement of this law is another issue, however. A decrease in the forest cover by illegal clearing even after the implementation of the 1996 Forestry Law is reported (Morse and others 2009), indicating the limitations of regulatory approaches alone. This section provides an overview of incentive mechanisms implemented in Costa Rica for conservation, particularly on lands owned by communities and individual persons, which complement regulatory approaches to make use of both carrot and stick.

Ecotourism

The annual number of international tourist arrivals to Costa Rica increased from 260,000 in 1985 to around 1.2 million in 2005, making the tourism industry the top earner of foreign currency in 2005 (Van der Duim and Caalders 2008). Costa Rica's economy has grown by promoting tourism, particularly ecotourism. One strong supporter has been the interests in scientific research, which have contributed greatly to appreciation of the rich biodiversity and other natural charms of Costa Rica. Scientists themselves have been a major group of visitors to the country; their daily expenditure is normally low, but they usually stay long enough to contribute to the local and national economy (Laarman and Perdue 1989).

Ecotourism is one way of financing land-based conservation. It has risks, however, that profit maximization might override conservation objectives in such forms as inappropriate eco-labeling and wildlife feeding (Campbell 2002). Without careful planning and policy intervention, according to Campbell (1999), local communities have limited opportunities to benefit from tourism development; it may create jobs for local people, but external interests such as investors generally take control.

A study by Place (1998) on Tortuguero, a coastal area in the northeastern corner of Costa Rica with a national park and a wildlife refuge, finds negative impacts of ecotourism development there, including the following three. A first obvious problem is the inflated cost of owning land properties and even visiting natural areas. This filters out medium to low income people in Costa Rican as clients. Second, revenues from tourism often leak to outside firms, rather than being retained locally in destination areas. Third, host communities often need to adjust their societies and cultures, such as foods, music and dancing, in order to accommodate tourists' interests. Thus, benefits tend to leak, while costs tend to remain in the sites.

Ecotourism has other limitations. Research in Costa Rica and Kenya revealed relatively low direct impacts of ecotourism on the economy of host communities (Weaver 1999). Even where ecotourism provides people in host communities with increased opportunities for employment and income, this does not necessarily lead to higher consciousness and attitudes towards conservation among local people; ecotourism's role in enhancing local communities' spontaneous practices for conservation has been limited, according to a study conducted near national parks in south-western Costa Rica (Stem and others 2003). Honey's (1999) overall assessment of ecotourism in Costa Rica is generally positive, indicating that negative impacts have been limited due to generally small-scale operations, education for tourists thanks to many qualified local guides, and contribution to local economy, while warning of risks associated with excessive rates of growth and too much dependence on ecotourism.

Bioprospecting

Searching for chemical compounds, genes, microorganisms, and other diverse biological resources to develop economically valuable products, such as medicine, is called biodiversity prospecting, or bioprospecting (Sittenfeld and Lovejoy 1998). This can be regarded as one of the strategies for conservation, since it requires protection of areas with those diverse biological resources in order to study and use the substances contained in situ. Therefore, bioprospecting is heavily dependent on the protection of biodiversity, as well as on areas that have high biodiversity in the first place. Although bioprospecting can also have negative impacts, if well managed, it could create incentives to protect wild habitats, and support the maintenance of protected areas.

Costa Rica established an institutional mechanism to promote bioprospecting. The National Biodiversity Institute was established in 1989 as a focal point of bioprospecting activities. Although it is a non-governmental organization, the Institute is strongly tied to the national government, especially to the Ministry of Environment and Energy. Since 1991, several contracts have been made with foreign corporations and research organizations, bringing approximately US$1 million per year to Costa Rica, which is distributed to the government and other public organizations (Crook 2001). The conservation sector, including the Ministry of Environment and Energy and the individual Conservation Areas, also receives a share of the benefits; an advantage of the Institute is its diverse funding sources made possible by its non-governmental and non-profit status (Crook 2001).

Other potential benefits from bioprospecting include increased scientific knowledge and technical skills of staff. An inventory of species has been developed by the trained staff called parataxonomists (Crook 2001; Evans 1999; OECC 1994). The National Biodiversity Institute has also promoted environmental education, which is highlighted by its recently opened INBioparque, a park that offers a guided trail walk to visitor, as a "gateway to Costa Rica's national parks" (INBio n.d.).

There are several critical issues in bioprospecting as an institutional mechanism for conservation. There is an imbalance of power in negotiations between multinational corporations and local suppliers (Crook and Clapp 2001). Details of contracts for bioprospecting are typically kept secret in order to protect the interests of directly involved stakeholders, and benefits are not directly shared by local communities, including indigenous people. Contribution from bioprospecting generally makes up only a tiny portion of the overall conservation budget (Crook 2001). Furthermore, a lack of financial and technological capacity within Costa Rica allows some of the processes to be undertaken outside the country, which could result in a loss of local control over the information value embodied in the product. While revenues from bioprospecting might

substantially increase in the form of royalty payments once a product is commercialized, there is no guarantee that such a product will be developed (Crook and Clapp 1998).

All these problems hinder bioprospecting from becoming either an economically rational choice or an ethically appropriate mechanism. Although its benefit could be higher than other land use options in many cases, such as logging and agriculture, it is difficult to assume that this will happen, or even that bioprospecting will pay much of the cost for conservation, at least in the short term (Crook and Clapp 1998). Besides, the nature of bioprospecting may take control and rights to use land and resources away from local people and other stakeholders. This can be regarded as a new phase in the capitalization and enclosure of nature (Escobar 1996; Zimmerer 2000). Although it might be too early to fully assess the effectiveness of bioprospecting for conservation, the exclusionary nature of bioprospecting could become a cause of new resource-related conflict.

Land trust

A Costa Rican non-profit organization called Centro de Derecho Ambiental y de los Recursos Naturales (CEDARENA), established in 1989, has actively arranged contracts with non-governmental land owners for supporting and monitoring environmental conservation on those lands. This arrangement is called conservation easements. A striking feature of CEDARENA's standard conservation easement is that it assists the clients in examining, and in some cases legalizing, their property rights. This is an important service especially in rural areas where property arrangements can be vague. In the late 1990s, CEDARENA extended the program into a more comprehensive form of land trust, in which the agreed conservation easement is recorded in the National Register. This prohibits a transformative use of the registered land theoretically forever. With large contribution by CEDARENA, there have been over fifty agreements of conservation easement established in Costa Rica (CEDARENA n.d.; Rojas and Aylward 2003; Swift and others 2004). Possibly the greatest motivation for entering into an agreement with a land trust for non-governmental land owners is increased security in property rights (Swift and others 2004). Because direct economic benefits derived from a land trust are almost non-existent, a land trust is most likely to be applied where: clarification of property rights is important as protection against encroachers; owners are interested in conservation (ELI 2003); and/or other incentives such as ecotourism are already in place.

Payments for environmental services

Payments for environmental services (PES) are a relatively new tool with direct incentives. Costa Rica is a pioneer country in adopting a PES scheme called *Pagos por Servicios Ambientales* (PSA). This dissertation uses PSA for the Costa Rican scheme specifically and PES for such mechanisms in general, as distinguished by Locatelli and others (2008). Introduced by the 1996 Forestry Law, the PSA scheme was initially considered as a means to increase the budget of the national park system, but its main beneficiary turned out to be forests managed as non-governmental property (Porras and Neves 2006). This policy is based on the notion that ecological functions provided by forests should be valued, and those responsible for conserving those functions be compensated. Among diverse types of environmental services provided by forests, Costa Rica's PSA identify four targets: 1) carbon sequestration, 2) watershed protection, 3) biodiversity conservation, and 4) scenic beauty. The PSA support preservation of primary and secondary forests, reforestation for both production and watershed protection, and agroforestry. In the case of forest preservation, contracted owners receive an annual payment of 17,420 colons per hectare (approximately 30 EURO or US$35 in November 2005). A contract is effective for five years, and is renewable.

There are several justifications for the implementation of PSA. It first emerged as a replacement for reforestation subsidies. The structural adjustment programs of the World Bank and the International Monetary Fund required that government subsidies to the forest industry be eliminated (de Camino and others 2000; Rojas and Aylward 2003). The government complied with this advice, and replaced the subsidies with PSA. The government's position is that PSA are not a subsidy to industry, but compensation to forest landowners for the forest management costs they incur under the 1996 amendment to the Forest Law (Snider and others 2003). Because the PSA do not consider opportunity costs, however, the amounts of PSA are not necessarily as high as revenues from other land use options such as agriculture (Snider and others 2003). Other competing interests are the logging industry and the pasture, the latter of which covers almost one third of Costa Rica's land (Castro and others 2000). This is a factor limiting the attractiveness of PSA for forest owners as an economic incentive.

The 1996 Forest Law established the National Forest Finance Fund under the Ministry of Environment and Energy, to allocate payments to eligible forest owners. Sources of the funds for PSA are: 5% fuel tax; bioprospecting contracts; carbon market transactions; the World Bank and other donor projects; and private transactions including electric power companies paying for watershed protection (Porras and Neves 2006). Using the fuel tax as a funding source was justified by the idea that forests are a carbon sink, and that beneficiaries of motor vehicles should pay for the protection provided by forests against global warming (Rojas and Aylward 2003). Identification of beneficiaries and service providers is not as clear in the case of watershed protection. Distribution of benefits and costs among all stakeholders is a difficult task not achieved yet, as the current PSA scheme depends mostly on voluntary participation of some corporations (Postel and Thompson 2005).

Despite all the efforts to seek funding sources, shortfalls for meeting demands occurred from the beginning stage. This resulted in a waiting list of eligible forest owners applying. In an interview, an official of the National Forest Finance Fund pointed out as one of the major problems that not all the money earmarked for PSA came to the fund. That money was first integrated into the general account of the national budget, as required by law. However, the full amount promised was not transferred to the forest fund.

A noteworthy characteristic of Costa Rica's PSA program is the role of intermediary organizations (Chomitz and others 1999). These organizations, including the Foundation of the Development of the Central Volcanic Cordillera for the central part of the country, and The Commission of Forest Development of San Carlos for the northern part, provide administrative assistance and technical advice on forest management to recipients. These organizations receive fees accounting for 12 to 18 per cent of the amount of PSA, while they reduce the transaction costs for small land owners by bundling applications and monitoring activities (Porras and Neves 2006). Applicants must submit management plans, and another important role of intermediary organizations is to certify them before submission (Castro and others 2000). The intermediary organizations play a particularly important role in extending the PSA to the countryside and building up local capacities for forest management (Locatelli and others 2008). For small-scale farmers with severely low incomes, the PSAs have the potential to improve their living conditions to a great degree (Munos 2004). Pagiola (2008) assessed the PSA program in Costa Rica after a decade of its implementation as an innovative pioneer, but found much room for improvement especially by strengthening the connections between the users and providers of the services in the funding flows.

Is Costa Rica a model?

It is debatable whether Costa Rica is a model for nations striving to enhance their conservation policy. For example, Hunter (1994) emphasized the country's rapid depletion of natural resources in the past, as a critique of Boza's (1993) review of Costa Rica's conservation policy published on the journal *Conservation Biology*. Mario Boza is one of the key players in the history of conservation in Costa Rica, and was the country's vice environmental minister when this *Conservation Biology* paper was published. He defended his position with updates on certification schemes in lumber and banana production, claiming that Costa Rica was not perfect but experimenting with a number of policy innovations that make the country special (Boza and others 1995). Boza's initiatives reached beyond the country's territory, promoting an international corridor initiative in southern Central America. He stated, "I dream of the day when a white-faced monkey will climb a tree in southern Nicaragua and travel to northern Panama, via Costa Rica, without ever leaving the treetops" (Boza 1993, 243). After his service as Vice Minister, Boza continued this pursuit, extending the coverage of the trans-boundary corridor to all of Mesoamerica.

Another issue is equity, or poverty reduction. Forest policy in Costa Rica has included components of sustainable development. Peasants' livelihood improvement was not necessarily addressed, however, as much as conservation or market-based forestry, particularly in the 1990s, although there are signs of change with donors emphasizing livelihood issues more explicitly than in the past (Silva 2003).

Evans (1999) concludes that Costa Rica's path as a "green republic" was introduced initially by European and North American scientists. They had great influence on Costa Ricans later becoming leaders in conservation policy. Peace, the stable political system, and the emphasis on education and other social services, contribute to the promotion of conservation-based development in Costa Rica. The combination of government intervention and market-oriented incentives have produced an example in which a country can reduce deforestation and reverse the trend to an expansion of forest cover without foregoing economic development (Brockett and Gottfried 2002). Forest conservation has spread in lands owned by communities and individuals, in addition to those owned by the government. Non-governmental forest reserves are generally smaller than governmental parks, but they function as buffer zones and wildlife corridors. They also address the social and economic needs of small-scale farmers and other disadvantaged people in rural communities.

Costa Rica has a number of achievements in nature conservation, while it also has challenges. What is effective in Costa Rica may not work in another country. Whether Costa Rica is a model or not is not the most important question. What are the specific characteristics of conservation policy and practice in Costa Rica? What lessons can be learned? These are the questions that need to be addressed. Not only developing but also developed countries have a lot to learn from the experience of Costa Rica.

Chapter 6: Communally Owned Forest Reserve in Talamanca

Introduction

This chapter documents the case of a forest reserve owned and managed collectively by a local community located in a county called Talamanca, the southeastern part of Costa Rica. Selected as an actual case of the concept of common property protected area (CPPA), this empirical study examines whether, and if so, how, the selected forest reserve contributes to nature conservation and local people's well-being. I visited the studied site in March 2004, and stayed there for one month as a volunteer. I also made a brief follow-up visit in June of the same year. I was allowed to stay at the house of the president of this community, hereafter called Lucas, who was also the key informant. Participant observation through my life as volunteer was the main method in this study, which was complemented by semi-structured interviews as well as open dialogues with the members of Lucas's family, other community members, NGO staff, and tourists. I also searched and collected documents regarding the studied site, although few such secondary sources of information were found.

The studied site is in a remote periphery of Costa Rica, where diverse ethnic groups live in an economy based largely on subsistence to low-income levels of agriculture. Low-key ecotourism was the only ongoing activity that the community conducted collectively. Through contact with outsiders, the community members knew the significance of conservation in the region, and broader concepts like sustainable development. Collective activities by the community members were much less than activities done by each household. My early concern in the field was that the case selection might not have been appropriate. Closer observations, however, made it possible to understand how a gap existed between the impression from outside and the reality in the site. The community members strategically balanced collective and household livelihoods, based on their own values and priorities in life. The chapter describes how the studied community and its forest reserve came to be, based on the information collected in the site and my own interpretation.

Talamanca: a peripheral county on the Caribbean coast

Costa Rica has seven provinces, one of which is Limon. Limon is located along the east coast of the country. The province of Limon consists of six counties (*cantons*) including Talamanca. Talamanca is in the south-eastern edge of Limon province, bordering Panama. Talamanca lies in the east side of the mountain range, sloping down towards the Caribbean coast in the east. Difficult access is a major obstacle for economic development of Talamanca. It is a remote periphery of Costa Rica, although the road network connecting Talamanca with major towns has been gradually improved.

Talamanca had a total population of 25,857, according to the national census conducted in the year 2000. The 2000 census showed Talamanca's illiteracy rate as 15.4% among residents of the age 10 and older. The figure in 1984 was 22.2%, meaning the reduction (improvement) by one third achieved during the sixteen years between 1984 and 2000. Nevertheless, Talamanca's illiteracy rate in 2000 was the highest of all counties in Costa Rica. It is far greater than Costa Rica's national average of 4.8%. The same trend was present at the provincial level. Among the population of five years of age or older as of 2000 in the province of Limon, 60.8% had received primary education only, and another 14.4% hadn't even received primary education. These figures

were greater than any other province in Costa Rica. Consequently, Limon's rates of population receiving secondary (20.3%) and post-secondary (4.5%) education were the lowest in the country (INEC n.d.). All these numbers revealed that Talamanca was one of the least advanced counties in Costa Rica in terms of school education.

Another demographic characteristic of Talamanca is ethnic diversity. There are three major ethnic groups in this region. They are indigenous peoples, Afro-Caribbean black people, and white people mostly of Spanish origin. The indigenous peoples are further divided into three subgroups: Bribri, Cabecar and Kekoldi. There are indigenous reserves designated for these people. Black people mainly live in the coastal areas. The history of black people, as well as Talamanca's economy, is tied closely with agriculture, particularly bananas. Tropical agro-export crops and their failure in successive waves are also an important background to the socio-economic situation of present-day Talamanca, where some communities are active in conservation, economic development and ecotourism (ATEC 1993).

Banana plantations spread along the railroad to the east coast, which was initially needed for shipping exports from the coffee industry. The country's central valley had volcanic soil and mildly warm and wet climate perfectly suitable for coffee production. By 1830s, coffee had become the most important export good of Costa Rica. In order to ship to Europe and the east coast of the United States, coffee beans had to be carried by boats leaving Puntarenas, a port on the Pacific coast, taking the extremely long route via the southernmost tip of South America. A railroad construction, contracted to a business group from the United States in the late nineteenth century, had a purpose of connecting the central valley with the port of Limon on the Caribbean coast, in order to facilitate the shipping. The labor force for clearing the tropical jungle and laying the railroad was provided mostly by Jamaican and Chinese immigrants. In order to recover the deficit of the construction, bananas were planted along the railroad. The railroad business and the Boston Fruit Company were merged to become the United Fruit Company (Kunimoto 2004).

The Costa Rican government encouraged people to clear wild forest lands by giving them land title. Although banana production was a corporate-dominated industry, many farms were owned by small holders. In the early twentieth century, banana was the leading export industry, surpassing coffee. The banana industry declined in the 1930s, however, due to the Great Depression. A fungal infection called Panama disease worsened the damage to the industry as well as the tropical forest, as more and more primary forests were cleared for cultivating new and temporarily disease-free farms; this trend continued until fungus-resistant varieties of banana were gradually introduced to stop the devastation (Soluri 2002). Currently, almost all of Costa Rica's bananas are produced in the Caribbean lowland, where the Afro-Caribbean culture of Jamaican descent is still present (Kunimoto 2004).

Cacao was another major product commercially grown, which had a peak period in the 1950s due to the rising prices of cacao in the market (Palmer 1993). The once booming industry, however, was badly damaged in the 1970s by *monilia*, a fungus causing extensive infection in the plantations. The cacao devastation is often mentioned in Calypso songs, the local music typically played by black people in Talamanca. A song titled *Monilia*, written and sung by legendary Calypsonian Walter Ferguson expresses the helplessness of cacao farmers in those days: "Monilia you come to stay. And all you bring is some hungry belly. You say you no going nowhere till you bring me down to poverty".

Diversification of the local economy became an important mission as a consequence of the cacao shock. Not only Talamanca's own people but outside groups began to pursue this mission. One important group was a non-governmental organization called Asociacion ANAI, which was founded in 1978 by people from the United States. The original name of the organization in full used

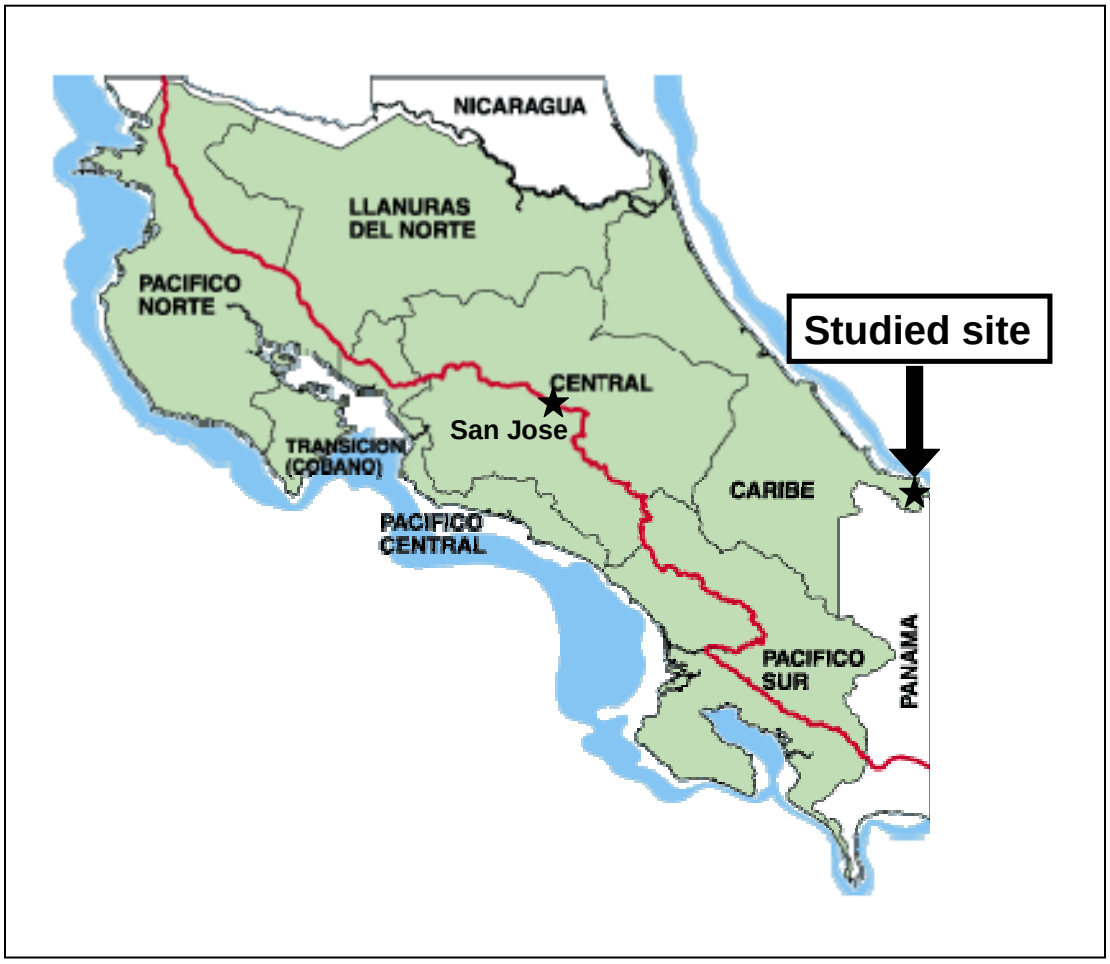
to be *Asociacion de Nuevos Alquimistas*, although the acronym became its official name. Its approach was to be a catalyst in prompting grassroots initiatives for conservation and development specifically in Talamanca (Asociacion ANAI n.d.; Social Profit Network n.d.; Wells and Brandon 1992).

To summarize, Talamanca is a county with great challenges: geographic, demographic and economic. It is a remote, ethnically diverse and economically poor region in the country. The community of this case study in Talamanca shares these characteristics to some extent at least, as described below in more detail.

History, property arrangement and ecotourism in the studied site

The studied community is located approximately eight kilometers inland from the Caribbean coast (Figure 12). The coastal lowland of Talamanca is categorized as tropical moist forest by Holdridge's (1947; 1967) ecological life zones. The life zone classification helps to describe the climatic conditions in the studied site, as no scientific data based on on-site measurement was available. The tropical moist forest zone has an average temperature of approximately 24 degrees centigrade or higher, according to the life zone classification. Precipitation is also high in this life zone, in the range between 2,000 and 4,000 millimeters. As the name of the zone indicates, the studied site is in a warm and rainy zone.

Figure 12: The case study site in Talamanca, Costa Rica



The community had a small population in a relatively stable trend, according to its members. Just over one hundred people were living in twelve households. Immigration and emigration were rare, although some residents were mobile for jobs outside of the community. Major land use patterns within the community were small patches of farms and pastures owned and managed by individual households. An industrial plantation of bananas was lying right next to the community.

There are indigenous people who have long lived in Talamanca, and some of their communities are currently protected as indigenous reserves. In the area where the studied community currently stands, however, settlement of the current residents has a relatively short history. According to the briefing material that the community association prepared for visitors, colonization of this area began in 1953. Settlers in those days consisted of Costa Ricans, Nicaraguans and Jamaicans. Jamaicans eventually moved out from this community, although the black people of Caribbean descent have high presence elsewhere in Talamanca. The province of Limon was a frontier, where job hunters came from many origins.

People in the community began to work together in an organized way during the 1980s with a three-year nursery project supported by ANAI. They planted 24 native species that were perceived to have high values in terms of lumber, as well as biodiversity conservation by providing habitats and food sources for wildlife (Piotto 2007). The nursery project in the case community provided community members with an opportunity to gain knowledge and skills in reforestation. When the

project ended in 1989, the community members decided to form a community association to extend their collective initiatives for conservation and development. The association had eight member families and seventeen individuals in March 2004. Each person or family in the community could decide to join the association or not. There was no membership fee or other obligation required. Decisions were made by a board of seven directors, which normally met once a month.

The studied forest reserve was 116 hectares including a primary forest, which the community association acquired after the nursery project with assistance from ANAI. This land was collectively owned and managed by members of the community association. The ownership enabled the community association to start collective initiatives. The first project was to research the conditions suitable for growing 27 native tree species, growing into an afforestation campaign. With the construction of a sawmill facility, lumber production became a central activity of the community. With the measures for sustainable forestry practiced, such as selective felling and log hauling using water buffaloes instead of tractors, the community association succeeded in being certified by the SmartWood program. SmartWood was a highly publicized scheme operated by Rainforest Alliance, with ties with the Forest Stewardship Council (Donovan 2000).

Lumber production, however, was not economically viable, and was therefore terminated in 2001 after five years of operation. Lucas recalled: “It was a nice project. Beautiful to see water buffaloes dragging the logs. It was covered in a number of media as well. But none of them reported that with each piece of wood we produced, we were losing money.” There was no effective channel to find and reach a market in which buyers would pay higher prices due to sustainable operation. Certification itself required fees, imposing additional burdens on the community.

Another major project was ecotourism, which was actually the only active collective project by the community association at the time of my fieldwork. The ecotourism project started in 1992 with the construction of a lodge for a maximum of 29 guests, as well as trails in the forest. The lodge has no electricity, but gas stoves were available for cooking. Tap water was coming from rain collectors and a well. Waste water had been discharged into the downstream creek. During my second visit, however, septic tanks were being constructed by youth volunteers from Britain. Upon installation, sewage would be treated in these underground tanks right next to the lodge.

Tourists usually drove to Lucas’s house first, where they had to leave the vehicles and to walk to the lodge through a ranch, boardwalk in the forest, and grassland. It was approximately a forty-minute walk, parts of which were wet and muddy. The walk was also instructive with observation of different land uses and ecosystems.

Guests’ meals were prepared by Olivia, Lucas’s wife and also an executive of the community association. She bought foods at the general store just before the guests’ arrival. The general store was located along the major road, in an adjacent district called Daytonia. From Lucas’s house the store was about fifty minutes’ walk away across the banana field. With a load of food and other products purchased, returning trips had to be on the road and gravel path by taxi, which took about 15 minutes. The meals served to the guests were simple and based on the local dishes. But they were also prepared in professional quality as Olivia had received training in San Jose on cooking for tourists. Guests were satisfied by the meals, giving many words of compliment.

The price in 2004 was US$35 per night per person, including accommodation, meals, a guided walk, and an evening presentation on the history of the region and the association. The price of one-day visit without lodging was US$15 per person. The lodge was used only for groups with reservations. There was no staff person on a full time basis except one senior male living in the lodge as a caretaker. Each time a group came, a team of workers were assigned from the association members. The visiting group needed to have at least five persons to cover the wages

for the workers and other costs such as food. Smaller groups visited the community from time to time, staying at Lucas's house instead of the lodge.

Conservation values of the forest reserve

The studied forest reserve was one of the remaining patches of natural forest in the coastal region of Talamanca, where much of the forest had been converted into other land uses. The most extensive land use in the region was banana plantation, occupying a large part of low land in Talamanca. In fact, the community of this case study was located right next to the plantation. Banana production was dependent on pesticide and herbicide, although research was underway to develop techniques to reduce the use of chemical substances and to shift ultimately to fully organic in a cost-efficient manner. The banana farm adjoining the community was not different from typical plantations in that it had almost no other plant on the ground, which showed bare soil and straight lines of ditches that were necessary for drainage. It was a landscape of monoculture, green at a glance but other species of flora and fauna were severely rare.

Another concern about banana plantations was their impacts on human health. Although no scientific data were found on the studied site, Lucas's family was pumping water from underground, instead of collecting the rain water. Rain was abundant in Talamanca and it was generally an easier and less expensive source of water. However, Lucas said the community members were concerned with chemical contamination from the surrounding banana plantations, and considered groundwater to be less harmful. In fact, one of Lucas's grandchildren was not well enough to live at Lucas's place. Following the doctor's advice, the family of Lucas's second eldest daughter had decided to live elsewhere, distant from banana plantations, for this child. It was feared that vulnerable people might be affected, even though there was no immediate health effect on a majority of people.

Pasture was another major use of land in Talamanca. Agricultural development with bananas and cattle had resulted in extensive forest loss, clear-cutting and converting forests into uses not supporting conservation of biodiversity and other environmental services. Protection of any existing forest, as well as reforestation oriented toward conservation, could mitigate this trend. A wide variety of wildlife including migratory bird species was present in the studied forest reserve, although several species like iguana and tapir had become scarce due to hunting and habitat loss. Such conservation values in Talamanca attracted outside organizations operating projects to support local initiatives for conservation, including the reserve of this case.

The only current use of the studied forest reserve was tourism, which could have negative impacts on the forest ecosystem. If done in an uncontrolled manner, such problems as overuse of trails, trash disposal and water contamination could generally arise. In the studied site, however, the level of tourist use was quite low as no severe impact was observed or recounted by informants.

The conservation initiative by the community association had connections with other initiatives in surrounding areas. The association's reserve and lodge could only be reached on foot, and the trail leading to the lodge went through forests owned by two international conservation NGOs: The Nature Conservancy based in the United States, and Tropica Verde based in Germany. As a way to protect tropical forests and support grassroots initiatives, these organizations were cooperating with the community association. The two patches of forests were mostly primary forests, and their management was entrusted to the association. Although small in size (28 and 18 hectares respectively), they provided additional forest cover connected to the forest owned by the association. Management of these forest areas did not require much work, as they were mature natural forests that could be basically just left as they were. Only when irregular events occurred the community members had to deal with them. An example of such events raised by Lucas was a tall

tree falling onto the trail, which would have to be removed. Maintenance of access routes was almost the only management duty necessary.

At a much broader scale, the association's reserve was a part of the Talamanca – Caribe Biological Corridor. Covered within the corridor were Cahuita National Park, Gandoca – Manzanillo National Wildlife Refuge, all or parts of the three indigenous reserves, and non-public lands. The corridor was being administered by a consortium of non-governmental organizations, including the case association. The corridor was also adjacent to La Amistad International Park extending across the border between Costa Rica and Panama. In terms of the National System of Conservation Areas, Talamanca was in Caribbean La Amistad Conservation Area. The Corridor was an important part in the Conservation Area as well.

Costa Rica's 1996 Forest Law set a principle prohibiting any clearance of natural forest while loosening and decentralizing reforestation and agroforestry, with a bold aim to automatically increase the total coverage of forest throughout the country (de Camino and others 2000). However, illegal forest clearance is reported, showing the difficulty of fully implementing and enforcing the restriction (Morse and others 2009). It should be noted that the studied forest reserve is protected not only by law but also by other supporting factors such as ecotourism, payments for environmental services, and normative values in the community.

Contribution to community development

Almost all the households were farmers producing much of their own foods. Cash was necessary, nevertheless, for children's education, and for purchases of daily necessities. Rice, for example, had to be bought because they were not producing it themselves. Tourism was the main source of cash income for participating community members.

Revenue from tourism was first going into the account of the association, and then distributed to members in the form of wages. This meant that no cash income was automatically generated for the association members unless they were actually engaged in working at the lodge. Such work was usually only one of a range of income sources for each household. In the case of Lucas's family, for example, more than half of the total income came from the sale of cows, chicken, eggs, fruit and other farm products, while 29 percent from tourism, and about 20 percent from the government payment for environmental services.

The association contributed to the community through donations to the local primary school, and to the church and village committees working on community issues such as road maintenance and improvement. The association had been funded by international donors, including the small grant program (up to US$20,000 per project) of the Global Environment Facility. A smaller source of revenue was the environmental services payment for a total of 116 ha, which provided approximately US$5,000 per year. Ongoing costs for operation included the construction of the boardwalks and maintenance at three-year intervals, as well as a mandatory insurance payment for each worker.

External groups had provided important support to the community and reserve. Surrounding forest areas were purchased by NGOs in order to complement the conservation value of the reserve. Funds have been granted by outside organizations to implement the projects of the community association. Three universities in Costa Rica, two universities in the United States, and ANAI were bringing study-tour groups to the reserve and lodge. The community association was also part of Talamanca Network of Community Ecotourism. This network was established to publicize the various lodges and service providers within Talamanca, and to "sell" the region as a package with diverse cultures of indigenous, black and white peoples. The community initiatives

would not have been undertaken in the same scale, if there were no assistance from external groups.

To summarize, the community association had pursued a number of initiatives, and even though several faltered, its capacity grew. Members learned how to host tourists and how to search and apply for funding. Most importantly, they learned how to work together as a group.

The fieldwork

This section describes the process of fieldwork as well as my observations of the local way of life, in order to add context to the case study.

Selecting and entering the field

My internet search found this site as a seemingly suitable case for this research. My correspondence with the community before my actual arrival in Costa Rica was limited, however. After several trials, a brief reply by e-mail came from the community, saying my visit would be welcome. I later learned that the internet was not used in the community, and the community members had to depend on one of the outside organizations for e-mail correspondence. After arriving in Costa Rica, I phoned Lucas from San Jose. Understanding my needs and request, Lucas said I could stay at his house as a volunteer. Finally feeling assured, I picked up my backpack and hopped onto an early-morning bus leaving San Jose.

There was a fairly good network of buses throughout Costa Rica. Being the national capital and also located in the centre of the country, San Jose was serving as the hub of the transportation network. There was a direct bus service from San Jose to the coastal lowland of Talamanca. It was a trip of approximately 270 kilometers in six hours. The route passed the continental divide near Braulio Carrillo National Park, and ran down to the port city of Limon on the Caribbean side. From Limon, the journey continued south along the coast line, stopping by two major tourist towns, Cahuita and Puerto Viejo, and then turning inland to Bribri, a gateway town to an indigenous reserve. The final destination of the bus route was Sixaola, a town bordering Panama. The studied community was within the district of Sixaola. Several kilometers after Bribri the pavement disappeared, and gravel road replaced it. The gravel road was wide enough to have two lanes, but had many bumps that prevented vehicles from cruising at a high speed.

Upon arriving at Lucas's house, I met Olivia who allowed me to use a bedroom on the ground-level of the two-story house. Lucas came back from work a while later and by 5:30 PM children were also back from school. The family members living in the house were Lucas, Olivia, three girls and two boys. Three teen-aged children were going to *colegio* (high school), and two younger children to *escuela* (primary school). The most important source of information was the people in the community. In particular, Lucas was the person with whom I spent the largest amount of time during the stay. He made me accompany his work, and taught me many things. All talks with Lucas, his family members, other people in the community, and visitors from outside were done in informal settings. The purpose of my research was explained beforehand.

Characteristics of the community were learned gradually during the stay. For example, houses of the community members were quite dispersed in a physical sense, although it had a fairly strong degree of unity in a social sense. It took about one hour on foot from the house at one end to the other end. The dispersal of houses made it rare to encounter other members in the community. The only exception for Lucas's family was a senior man, whose house was only about fifty meters apart from Lucas's. This neighbor was living by himself, basically self-sufficiently. Lucas often passed the chicken eggs to the neighbor, who would go to the town to sell them to banana workers.

This modest cash income as a middleman was used for buying things for pastime, such as cigarettes and newspaper.

Lucas's family was ethnically diverse, as was the whole of Talamanca as a county. Lucas described himself as "white" Spanish descent, although his skin was deeply tanned. Olivia was half indigenous and half black, and thus their children came from three ethnic streams. There was one indigenous family living near Lucas's house. Most of the other residents in the community were Spanish descent. The overall level of ethnic diversity within the community, therefore, was not necessarily high. I wondered how the community members kept themselves united. An occasional mass turned out to be one effective means for them to gather. There was a modest church in the community, and the mass was held when a priest from another town visited the community. Other than that, there was no occasion for the members of the whole community to meet.

The local way of life

A day for the family started very early. The parents were up in the kitchen at four o'clock in the morning to prepare breakfast. The children took a shower in turns, dressed themselves and had quick breakfast between 4:30 and 5:30. The three children left at 5:30 for their high school. They walked about a half hour to an intersection to catch the school bus. By 6:00, the two younger children left for their primary school, which was about fifty minutes' walk away. Schools in Costa Rica generally start around seven o'clock in the morning. By the time children left for school, the dark was gone and the parents already started their labor of the day. I got up around five o'clock as advised by Lucas in the beginning of my stay.

Most of the time during my stay, I accompanied Lucas to help his work. There were various kinds of work in the farm. One task that had to be done everyday was feeding the livestock. The family owned about a dozen of cattle, grazing in the pasture. Water for them was abundant, and there was not much to do for them. Other animals had to be taken care of. There were two pigs and about three dozens of roosters and hens to feed. The pigs were fed with various kinds of vegetables available at the site. The roosters and hens were fed with maize. Cages for the livestock were placed near the house. These cages had to be cleaned as well.

The family was growing a variety of crops, with maize being the most important. The family had a maize field of approximately 0.1 hectare, located roughly one hundred meters from the house. Because there is no winter or dry season in this region's climate, maize was grown throughout the year. The field was divided into three sections to disperse the harvesting season continuously and evenly. This also dispersed the labor of seeding, weeding and harvesting. Maize was husked, threshed and given to roosters and hens. Some portion was graded for younger chicks. It was also used occasionally for tortillas that the family consumed. Work in the maize field was very *duro*, or physically hard. Weeds had to be removed, and this task in the heat was exhausting. Harvested maize had to be kept dry. When the weather was wet, therefore, or only little time was available, we threshed maize by hand under a cover, instead of harvesting it. Sitting together with Lucas to do this work provided me with precious time to hear many stories, often mixed with jokes. There were other crops that the family was growing, including banana in a 0.03 hectare field, but nothing needed as much labor as maize. Other types of work included cutting, shaving and carrying woods, harvesting fruits and vegetables, and so on.

As the day started early, lunch time was naturally early, too. The normal time for lunch was between 10:30 and 11:00 AM. As described earlier, there were various types of work. Although intensity differed slightly day by day, there were always things to do. Therefore, labor continued in the afternoon until about four o'clock. Children came back from school by five o'clock. Hungry siblings helped themselves to supper. This occurred between 5:30 and 6:00 PM. Meals in this

family were consumed rather individually, not altogether. Whenever someone was ready and hungry, that person simply prepared a plate and started eating.

After supper, all family members sat on couches to relax watching soap opera on television. Their television set was a small, black-and-white one with antenna. By careful adjustment it was able to tune into several channels. While watching the television, three children going to high school ironed their school uniform in turns. After spending a day in the tropical climate, and walking a long way to and from school, they had to wash shirts and trousers every evening. Tidying up the school uniform was an important requirement at school, which I regarded as a sign of education taken very seriously in this country. The iron was an electronic type, but the electric cord had been cut off. Instead, they heated it on the cooking stove connected to a tank of liquid natural gas. It took about a minute to heat up the iron by gentle gas flame for a minute's use of ironing. At first, I suspected that they were making use of an old iron already out of order, instead of buying a new one. However, the true reason was soon found out. There was electricity, but not enough for all appliances.

Electricity was in fact very precious. There was a solar panel on the roof, which generated power just enough for a few electronic appliances, such as a cellular phone, refrigerator, radio and television. Due to the limited capacity of batteries, however, they had to minimize the use of electronics in the night time. Only one light was turned on in one common space. The refrigerator was turned off in the evening. At eight o'clock at night, after enjoying a few soap operas and switching off all the electronics, all the family members went to bed. There would not be enough electricity available up to midnight. As each day in this lifestyle started early, it had to be ended early anyway.

On weekends when there was no school, all family members got up a little later than weekdays. Parents worked on weekends, too, though not as much as weekdays. Children did house choirs voluntarily, such as sweeping the floor and cutting wood, for example. Helping the house chores on weekends and breaks from school was a rule of the family, and children always found some work to keep the promise. Other than that, children had assignments from school, relaxed with music or television programs, or went to a nearby creek to enjoy swimming.

Children sometimes stayed overnight at a friend's house. Lucas's house also hosted classmates from time to time. Visiting friends enjoyed the night of stay, and behaved politely to the hosting parents. With no unusual activity, this overnight visit to each other's house between friends was apparently a fun part of their life.

Housing and other basic needs

The current two-story house was the third one to the family. Construction was close to completion, except wood windows and some details. The first floor had a spacious kitchen, dining and living, as well as a bathroom and a spare bedroom. The second floor was made with wood only, having five bedrooms and a balcony. Houses in Talamanca were typically wood-built and elevated above ground level for approximately one meter. The elevation was more as a measure against occasional flooding than heat. The ground-level floor of Lucas's third house was built with concrete, making the elevation unnecessary. There was another house being built approximately 50 meters east from the third house. This fourth house was for the family of Lucas's second eldest daughter. Her family had its residence in town, approximately one and a half hours away by bus and on foot combined from Lucas's house.

The housing history showed how the family grew, raising seven children and one of the grandchildren. The first house, approximately 100 meters north of the current house, had almost no trace of existence, now in the middle of the ranch. When I arrived at the site, the second house was

still standing, approximately 50 meters west from the current house. Later during my stay, however, this abandoned second house was demolished to collect wood and even nails that were in good enough shape for using for the third and fourth houses. Lucas said that the wood was old, but still generally in a good condition, because it had come from old growth trees. The family and I did this hard work to break down the house into pieces. For construction of the new houses, a professional carpenter was hired from town to spend several days in each work session. After several more sessions, construction of the third house would be completed. Payment to the carpenter was calculated on the basis of the number of days at work in each session. To save money the family members were doing all the tasks they could do by themselves.

Water was pumped up from underground, a source at four meters below surface, to be used for drinking, cooking, washing and shower. I noticed a very slight brown color in the water when washing the clothes. But there was no immediate health effect observed. Everyone was drinking that water including myself without getting sick. Rain was the common source of potable water in places with high precipitation. This option was avoided in this community, however, because of the banana plantation. The banana farm was too close, only about fifty meters away, and residents feared that the rain water might be contaminated with chemicals used in the plantation.

Meals of the family were simple but sufficiently rich in both quantity and quality. Rice and black beans were served everyday as the staple food. Typically, rice and beans were cooked separately at first, and the next morning they were fried together as *gallo pinto*, one of the staple dishes of Costa Rica. Several important food items such as rice, beans and milk were purchased at a store. However, there were many kinds of foods coming from the family's own farm and garden. In addition to maize, more than fifty kinds of fruits and vegetables were grown in the family's garden. Some of them were harvested and consumed at home, including banana, coconut, ranbutan, acerola, and cashew nut. Mangosteen was everyone's favorite. Plantain was fried to become a delicious side dish. *Pejibaye* (peach palm) was harvested in a large cluster approximately once a week, and boiled to be served. Tasting a little like a sweet potato, Lucas and Olivia liked it as a snack with a cup of coffee, although one of their daughters said she hated it. Left-over portion was given to pigs. Habanero chili was picked from the garden for cooking. It was also put in banana vinegar to make a condiment for any type of food. Star fruit was not used for making juice. Lemon grass was boiled to make tea. I once had a sore throat, and Olivia prepared lemon grass tea as a folk medicine. These fruits and vegetables, as well as home-grown eggs of hens, contributed to the high variety of foods consumed at home. Meat was consumed rarely.

There was one item, which could not be missed in the dining table of the family. It was coffee, the pride of the whole country. Costa Rica's coffee production is concentrated in the central valley where the soil and climate are well suited to growing coffee trees. Humid lowland like Talamanca was no place for coffee production. Just like most other Costa Rican families, however, a day of Lucas's family had to start with a cup of coffee. In cities, there were upscale varieties of coffee known for quality. In the countryside, people drank coffee made from cheap brands of beans. I noticed some brands of ground beans contained ten percent of sugar. It was said that the quality of beans was so low that sugar was necessary to cover up the bad taste. Personally, however, I liked every single cup of coffee in Costa Rica, including the cheap ones. I saw no local person drinking black coffee anyway. Lucas had to make his coffee very weak because he was sensitive to caffeine. In any case, coffee was never missed; it was an important part of their lifestyle.

The lifestyle in Talamanca was a very basic one, but daily necessities were available in the house. Lucas said: "We have little money. But we can have three meals everyday. We grow and harvest most of the food we eat. I hear there are people in the world, who can eat only once a day. Here, even pigs are fed twice a day." Another thing to note is that there was very little solid waste

generated from the house. All of the organic waste was thrown in the yard to become natural fertilizers. Combustibles were used to start fires in the yard when cooking pejibaye in a very large pan. The rest was a very small amount of waste that had to be collected separately, such as used batteries. Waste water was treated with basic filtering in septic tanks before being discharged into the ground.

Banana plantation

A creek ran near Lucas's property. On the other side of the creek was a large farm of bananas belonging to a large corporation. As commonly seen in many banana plantations, this farm had bananas planted in a mechanically consistent pattern and density. Under each mature plant was another tree of middle size, and one more of small size. Lucas explained it was a typical way of growing bananas, using three generations at once. A mature one produces fruit until it is aged and cut down. By then, the next generation would have grown up to take over the productive role. In this way, fruit can be harvested consecutively.

Wire cables ran through and across the fields about two meters above the ground, forming a systematic grid. These cables support pulleys that carry the harvested clusters of banana fruit. Workers also hang their chair-like pulleys to move across the field quickly. To other local people, the banana farms were useful shortcuts. One cable extended across the creek separating the banana field and the property of Lucas's family. The family possessed a couple of chair-like pulleys as a means of entering the banana field and sometimes as a vehicle to cross the field all the way. A few days after I came to the community, younger children took me to show me how to ride the pulley chair. The rider had to run for a few meters to give velocity and then jump onto the chair. It was just a simple repetition of this movement even to go in a long distance. The children were used to it and had no difficulty riding it fast and long. Maintaining the speed consistently was not as easy for me as it looked. If the chair slowed down where the wire was too high for feet to touch the ground, the rider could be trapped in the middle of the route. I enjoyed the practice to improve my skill little by little as if learning a new sport. To those working and living there, however, it was a serious and important tool for carrying out their livelihood activities.

It also served as a useful shortcut between Lucas's house and the little town of Daytonia with a general store, a truck station to load bananas, and a bus stop. It was approximately a fifty minutes' walk across the banana fields from the house to the town, much shorter than walking down the trail for one hour and a half. Lucas and his family members used this shortcut whenever they needed to ride a bus, or go to the store. With a pulley, the trip could become even shorter.

There was a small aircraft regularly flying above the banana farm. When I first heard the sound of this aircraft, it was so loud that I thought it would crash onto the ground. I went out to see the plane, and was surprised to find it flying as low as only ten meters above the ground. The plane was spraying the field with chemical substances. Exact contents were unknown, but likely to be herbicide and pesticide. I was exposed directly to the spray one day. I had to go to the town of Daytonia, and took the shortcut in the banana field. I heard the plane coming, flying back and forth to cover all parts of the field to spray. There was no way for me to avoid the exposure. I found the notice board informing the farm workers of the spraying schedule after exiting the farm in the other side, only too late. I felt no immediate effect but thought of health concerns in the longer term.

Education and a sense of nationality

The studied community was very close to the Panamanian border. The television at Lucas's house showed programs on Panamanian not Costa Rican channels. One day, we talked about a *telenovela*, or a soap opera, called *Mariana de la noche*. This very popular show was broadcast

widely in Latin America at the time. Lucas's daughters replied cheerfully and a little proudly that they were watching it ahead of times. The Panamanian channel was broadcasting the show a few weeks earlier than Costa Rican stations. There were other occasions as well, that showed the influence of Panamanian popular culture among the children in the family, with music being the most notable. Tunes mixing reggae and rap on Panamanian music programs were favored by the children.

I once suspected that people in this community might be feeling as strong, if not stronger, ties with Panama as with Costa Rica. This assumption was soon proved wrong. Even in this peripheral place of the country, there was absolute clarity that the nationality of the people was Costa Rican. They were proud *Ticos*, or Costa Ricans, and one clue was education. Schools are run very seriously throughout the country. Schools of all levels, from primary to higher, fly a national flag. Students are dressed in uniform, normally a white or light-blue shirt and dark-blue trousers or skirt. Their hair is combed neatly for school, and it is common to give a hair cut just before the new school term.

The importance of education in Costa Rica was visible in many ways. Lucas advised me to go to the local primary school one day. I expected to learn general issues about the community by talking with the teacher and observing the class. This visit, however, turned out to be a disappointment. After walking on a muddy trail with the two children from the house for about three kilometers, we reached the school where about ten children attended. They told me that there was only one teacher for all of them in different grades. We, and even the cook who would prepare lunch, waited for the teacher, but unfortunately she did not show up. While waiting, I chatted with the curious children. One boy climbed up the tree in the yard, picking fruit of a local variety of apple. My travel knife was appreciated. About one hour later, we finally knew that the teacher had someone sick in the family and would take the day off. While I had a good time with the children, the absence of the teacher was unfortunate. Back at home, Lucas criticized the teacher for being irresponsible, and extended his distrust with the government in general. The missed opportunity on that day for me to observe the school was disappointing, but at least created a chance to learn how Lucas perceived the government and public services in general.

Sustainable development in the local context

Lucas often mentioned *desarrollo sostenible*, the Spanish translation of sustainable development. It was used frequently in our conversation, sometimes as a joke. For example, early in my stay we were slicing the log with a chainsaw. The sawdust was collected and stored in sacks. It would be put onto the floor of cages for roosters and hens. The wood dust would absorb bird droppings, and after a while it would be replaced with fresh sawdust. The used dust would then become a fertilizer. "That is *desarrollo sostenible*!" he shouted with a mischievous smile. A similar example was the shucks of maize, which was composted on the banana field as fertilizer.

The reuse of wood from the old house for the new houses was certainly another example of *desarrollo sostenible* in Lucas's sense. On another occasion he said, "When you have no dog, you have to hunt with a cat." It became clear that Lucas interpreted sustainable development as making the most of what was available. This interpretation went beyond my imagination on one occasion when Olivia had a new haircut without going to a town. Asked about it, she answered that she and the neighbor exchanged a haircut. She smiled and said, "Desarrollo sostenible!" It sounded a little strange to call their mutual haircut sustainable development. But this proved that the local context of sustainable development in this community, or at least in this family, was exactly what I had come to understand, that is "making the most of what is available".

Hard work and no belief in luck

During my stay, one group cancelled its visit to the reserve due to rough sea conditions. The group had been on a boat and was planning to land on the beach of Gandoca. However, heavy rain and rough weather caused high waves and storm surges in the Caribbean Sea making the travel plan too dangerous. While the final decision was made at the last minute, the community association had already made all the preparations such as cleaning the lodge and buying food. Though the travel agent offered to pay a small amount of fees to the association, it was not enough to cover the salary and other costs for that particular occasion. This time the association had to absorb the loss in its budget. I said "*Mala suerte*" (bad luck) to Lucas. He responded, "Do you believe in luck? I don't." He used an example from his boyhood when he was a small but good soccer player. Lucas claimed that he had overcome the physical disadvantage with tricky techniques. Thinking and trying hard opened a door to success, according to Lucas. "Talking about luck underrates efforts," added Lucas. My interpretation was that Lucas and his colleagues in the community perceived that the only way to improve the quality of life is to fight and overcome all kinds of difficulties around them, instead of wishing luck. To them, accepting negative results as "bad luck" meant losing without fighting.

Distrust with outsiders

Among many jokes Lucas told me, there was one expressing his cynicism about so-called outside experts:

> A consultant came from outside to work on a community project. One of the tasks was to find out a suitable route to create a trail for people to pass and carry logs. The consultant asked a villager: "How do you normally find the most technically suitable route?" The villager answered that they would make buffaloes walk. Loosely guided by humans in the direction of destination, buffaloes would instinctively find a better path to walk on. "When buffaloes are not available", said the villager, ""We have no choice but hire consultants."

This joke was a sign of distrust against people coming from outside as "experts". On another occasion, Lucas said more explicitly, "Those people in San Jose and other places don't know me. They come only sometimes and say bad things about me, but they really don't know me".

Another problem with outsiders arose when the septic tanks for sewage treatment were being built. A British non-governmental organization offered to bring groups in a few phases to stay and work in the forest reserve for a few weeks respectively. The first group was undertaking the construction of septic tanks during my second visit to the community. They camped out in the front yard of the lodge. The main purpose of this organization's program was to provide such an opportunity to live and work together in a group with youngsters with problems. The labor of the volunteers was a gift for the community to improve the infrastructure while saving the cost. This appeared to me an ideal collaboration for mutual benefit. The community association found it very difficult to work with this group, however. The group consisted of about a dozen teenagers with strong personalities, and effective teamwork did not always result.

The biggest problem for the community was that the volunteer group did not want to receive instruction on the methods and techniques of tank building. The group claimed that finding a way by the kids themselves was important. While this trial-and-error approach might have been useful for the group, to the community it meant a waste of time and resources, as well as an increased chance that the water tank would malfunction. There was much experience in the community with the filtering system using waste plastic pieces, but the group insisted to use gravel, which was a

precious resource to the community. Lucas and Olivia said they did not want another group to come. This potentially symbiotic cooperation was not functioning as intended.

Achievements and future prospects

This case showed one actual example of common property protected areas in the countryside of Costa Rica. The reserve was owned and managed collectively by the members of the community association. It was small in size but playing an important role in terms of the conservation of ecosystem services in a larger landscape by connecting with other protected areas nearby.

Despite the achievements, the community faced several challenges in its forest management. During the fifteen years after the association's establishment, its collective activities were scaled down. Lumber production, once certified as sustainable forestry, had been terminated for lack of a market. Tourism was the only ongoing project, and even this was not in operation on a full-time basis. For the month of March 2004, for example, only two groups had reservations at the lodge. One of them had to cancel its visit due to rough weather, as mentioned earlier. Although there were busier months like June and July, when several North American universities organized study tours, the lodge was not always occupied.

Collective activities in the community were much less in quantity than the impression from secondary sources of information of the case obtained before the fieldwork. These sources reported the community's activities in forestry and tourism as successful stories (Kolbe 1997, cited in GTZ 1998; Rainforest Alliance n.d.). After returning from Talamanca, I visited the office of ANAI in San Jose to interview one of the founding members and executives of ANAI. While acknowledging the achievements made in this community, he also pointed out a lack of marketing to reach potential customers worldwide. This limitation was contrasted with ANAI's own voluntary tourism in Gandoca, a coastal village in Talamanca, for sea turtle protection attracting many participants who were willing to pay most of the cost. The ANAI executive said:

> For the ecotourism project to be successful, it is necessary that someone from outside do the marketing, who has skills and resources. Successful local businesses are mostly tour guides who devote all of their energy to the work. They find the needs of customers and can quickly adjust to these needs. Members of the community [studied in this research] are more concerned with animals they raise than the community project, for example. Because decisions and actions are made in a collective way, quick response to the market is difficult. Their clients are several university groups, but it is not the association that reached out. It is those universities that found the location. That is not marketing.

The community members themselves did not necessarily think of the low level of income from collective activities as a problem, however. Lucas said to me earlier:

> It is true that we need to fill a thousand bed-nights per year to be profitable. But if we have more tourists, I cannot spend my time in my own farm. I may be able to earn more cash that way, but then it means my family belongs to no land.

The reality in the site may be the most important lesson of this case study. Community members were spending most of their time and efforts for livelihoods of their respective households. Growing crops, vegetables, fruits and animals for subsistence and for modest sales was the central activity for the community members. Prioritization of household livelihoods over collective activities was a carefully selected strategy based on the values held by the community members. They chose to "belong to land" by living on small-scale agriculture. Other alternatives might bring much more cash to community members, but they opted to live in their preferred lifestyle, instead of

pursuing greater economic wealth. Cash was necessary even in the simple farm life for house construction and children's schooling, for example, but they could earn just enough amount of money from the low-key tourism. More tourism would result in giving up part or all of the household activities for livelihoods. The current level of tourism was a consciously struck balance. It was not really a result of insufficient efforts of marketing.

The level of forest use was kept low to moderate in this way, avoiding both an overuse of the forest as well as other environmental impacts. The controlled use was also consistent with the objective of protecting the forest ecosystem in the site. In my view, this strategy had another effect that the livelihoods of the community members would receive much less impacts from unexpected, negative and external factors, such as economic depression, wars, diseases, natural disasters, and so on, because the community was not highly dependent on income from tourism.

A new plan was about to start in the community I visited, connecting household livelihoods with tourism more directly. About ten community members were meeting at the classroom of the local school, in order to explore possibilities of starting a nursery of horticultural plants at each household. An expert from the office of Talamanca – Caribe Biological Corridor was the invited lecturer. Lucas arranged this meeting. He had been operating a nursery, though in a small scale, with great passion. Occasionally visitors had bought his seedlings, making him believe that this was something other community members could also try. Lucas said to me, "It's not good that only a few persons succeed. When one succeeds, we want to share it."

Similarly, animal farming was beginning to operate. Cages had been constructed for roosters and iguanas. Financial support was being sought from external organizations, in the context of ecotourism development. The idea was to allow a small group of visitors to stay with local families, instead of at the lodge. Lucas's family had been hosting small groups. He was trying to extend it to other households in the community. Animal farms would become a key attraction for visitors.

Lucas's leadership was one of the most important factors for decisions and actions that the community had chosen. His strong belief in hard work instead of luck, as well as the attitude to try new things, was influential. Demonstration of these values and efforts spread within and beyond the community. Lucas's family could have become much better off than other families in the community. It was not their choice, however. Lucas emphasized his willingness to learn and grow together.

Some of these important lessons would not be found by formal evaluation by donor organizations, for example. Because the community association had received assistance from outside for tourism and other collective initiatives, answers to formal questionnaires and quick interviews would not reveal true values held by community members. It would not be strategically wise to tell the donors honestly that they like to keep their collective projects modest. External evaluations, therefore, would find the community activities only moderately successful, with the business potential not fully realized. This type of evaluation would overlook the community members' true values and strategies hidden underneath the surface.

Living and working together as a volunteer provided me with a suitable position for learning the insiders' views. Local values and ways of life were experienced intensively. It also saved much time to gain access to the community and the key informants. There was a fairly clear role already set for a volunteer, because there had been several volunteers from abroad previously. There was no need to ask too many questions. Findings came to my attention naturally during the stay, even from the initial stage.

What will come in the future in the studied site? I found several challenges that might influence the pathways in the future. If the community pursued growth in tourism, a formidable barrier was the tough access. This was a problem in two scales. One was the difficulty in reaching the region from cities, particularly from San Jose. This barrier was being lowered, as pavement was

gradually extending toward the border town of Sixaola. I saw much progress made even in the three months between my first and second visits. Large trailers transport bananas on this road, and the road improvement was an apparent benefit for the banana trading corporations. The tourism industry would also be a beneficiary.

The problem in the other scale was the difficult access to the forest reserve even within the region. Visitors needed to walk for forty minutes to reach the lodge after getting off vehicles in front of Lucas's house. From a bus stop on the road, it took even longer. The trail leading to the lodge had wet and muddy sections, as well as slippery boardwalks, that could be part of tourist attractions but not favored by all types of visitors. Lucas told me of a plan to build a transport system with vehicles hung from a cable line leading to the lodge from Lucas's property. The vehicle has a bicycle-like chair, on which a passenger would pedal to move. The basic concept came from the cable lines in the banana farms. Construction of such traffic infrastructure would need a large amount of budget, of course. Lucas was writing a proposal to seek external funding. If this innovative system was in place for operation, accessibility to the lodge and forest reserve would improve substantially without causing much damage to the forested area. This system itself would draw attention from the public as a fun attraction. This idea struck me as an example of Lucas's never fading curiosity and willingness to try new challenges. Lucas's usual smile and shining eyes like a mischievous child while talking about the plan were unforgettable. The environmental and socio-economic impacts of tourism growth if accessibility is improved are not certain, and require further research.

Another infrastructure issue was the lodge. It was designed and built to last for ten years. This period had already passed, although there seemed to be no immediate danger at the moment. How to finance reconstruction in the near future was an important and difficult issue. Maintaining initiatives can be more difficult than starting them. What will happen with the next-generation management after Lucas and Olivia completely retire? This is another question needing longer-term study. The second eldest daughter had a husband working for a conservation group. They were planning to move from a town to a new house being built in the community. Also, the younger son of the family was showing interest in the work in the forest. These were signs of possible succession, although not all the children were likely to stay in the community. The eldest son in fact had moved to the United States upon marrying a former volunteer from the U.S. Many influencing factors, internal and external, as well as predictable and unpredictable, make it difficult to forecast the fate of the community and its forest at this point.

Chapter 7: Individually Owned Forest Reserve in San Carlos

Introduction

This chapter documents the case in Costa Rica of a forest reserve owned by an individual person. The main objective of this case study is to examine how the forest reserve of individual property is managed, and how the activities related to the forest reserve are functioning in terms of forest conservation and community development. The studied site is located in the county of San Carlos, a northern part of Costa Rica. I stayed in the site for five weeks in January through February 2004, and made another brief visit in July of the same year. The owner had a lodge right next to the forest reserve, where I stayed as a volunteer worker. Participant observation was the main method adopted, complemented by document search and interviews with various stakeholders including the owner, the staff at the lodge, local community members, and staff of conservation NGOs.

The studied forest reserve, when acquired by the current owner in 1981, was an intact primary forest, hard to reach due to the wetlands surrounding it. After several years of leaving it unused, the owner improved access in order to start ecotourism, with the primary forest and lagoons kept as main tourist attractions. A lodge was built to host the tourists with relatively small impacts on the natural environment. The tourism business eventually became profitable, although its operational costs were greater than revenues for about ten years in the beginning. A source of revenue other than tourism was the environmental services payment by the Costa Rican Government for forest owners nationwide. The amount of payment to this forest reserve, however, was very small when compared to the revenue from tourism. The forest was used only for guided walks in a non-intensive manner, and not for extraction of any natural resource. This way of forest management continued largely due to the owner's personal values. The owner's other profession with a financial institution was a steady source of income, helping his endeavor in the studied site that was initially not profitable.

The size of the studied forest reserve was only 110 hectares, but it was an important component in larger networks of the protected area system. The reserve was inside Maquenque National Wildlife Refuge. National wildlife refuges of Costa Rica cover not only government property but also other types such as common and individual properties. The Maquenque Refuge was the core protection zone of San Juan – La Selva Biological Corridor. Particularly as a part of the remaining but decreasing habitat of the endangered great green macaw, conservation movements were active in promoting the protection of existing forests including the studied reserve and some other adjacent forest areas.

Just as all other natural forests in Costa Rica, this forest is officially protected by the 1996 Forest Law with a principle of prohibiting any clearance of natural forest while loosening and decentralizing reforestation and agroforestry (de Camino and others 2000). It is technically impossible to enforce the regulation throughout the country, however. Payments for environmental services, also introduced by the 1996 Forest Law, are an incentive mechanism to support the regulation. Other incentives in this case study were ecotourism and personal values, which are described later.

The owner of the studied forest contributed to the local community in various ways including the following. First and most importantly, he provided jobs for local people. Second, the owner of

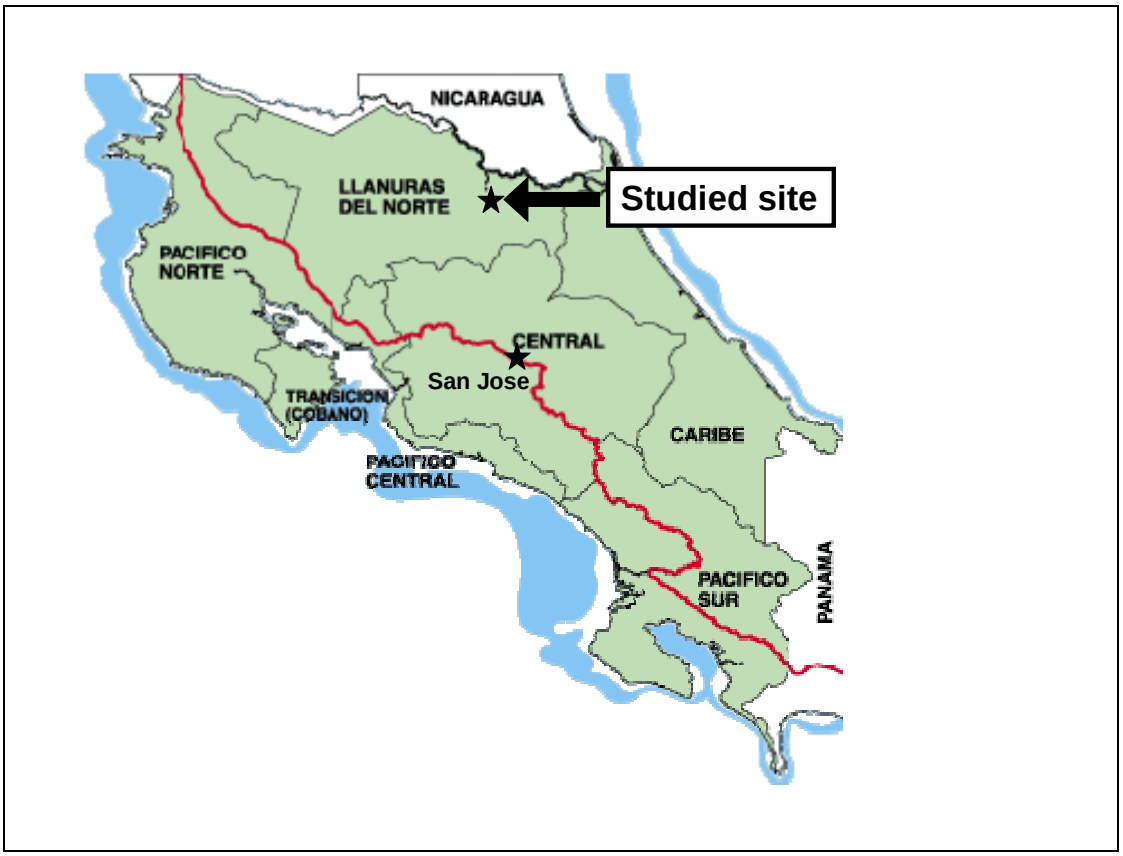
the studied forest reserve had prompted negotiation with authorities for infrastructure development in the area, including roads and electricity. Third, the owner had brought youth groups from the U.S. to stay in the lodge for several days for carrying out volunteer work in the community. Fourth, the owner was supporting other businesses in the community. Young persons trained at the lodge began their own business of operating guided canoe trips on the river. Another resident built a second lodge in the community to expand ecotourism, to whom the owner of the studied forest provided advice.

This case study found that individual property can be one form of ownership enabling forest conservation while improving the well-being of local people. The owner's personal values and perceptions, other steady income source, and collaborative relationship with the local community were keys for the achievements of this case. An ongoing transition of the forest ownership from individual to group property, increasing interactions between the community members and outsiders, and broader conservation schemes such as a national wildlife refuge and a biological corridor would be major factors that might affect the forest management as well as the culture and economy of the local community in the future.

San Carlos and the case study site

The northern part of Costa Rica, including the province of Alajuela, is an agricultural centre (Blake and Becher 2002). San Carlos is one of the fifteen counties within Alajuela. The northern edge of San Carlos borders Nicaragua. The high mountain range of the region lies in the west of San Carlos, placing San Carlos on the slope descending eastward down toward the Caribbean Sea (Figure 13). The national census conducted in the year 2000 showed that San Carlos had a total population of 127,140 (INEC n.d.).

Figure 13: The case study site in San Carlos, Costa Rica



In terms of its position in the national conservation network, San Carlos lies in the Arenal – Huetar Norte Conservation Area, one of the eleven areas set in the National System of Conservation Areas. Arenal – Huetar Norte Conservation Area contains two national parks within its range: Arenal Volcano and Juan Carlos Blanco. Other protected areas in this conservation area include three forest reserves, four wildlife refuges and two protected wetlands (SINAC-MINAE 2003). San Carlos is also within San Juan – La Selva Biological Corridor, a zone designated for conservation as a result of collective initiatives starting in 2001 by non-governmental organizations, government agencies and local residents in Costa Rica.

The forest reserve of this case is on the northern periphery of San Carlos, only 16 kilometers south of the Nicaraguan border. It stands near the San Carlos River that flows northward in the lowland until it merges with San Juan River. The San Juan River defines the northeast border of Costa Rica. The elevation of the studied area is less than 500 meters above sea level. According to the *life zones* defined by Holdridge (1947; 1967), the studied site lies on the border between two zones, namely *tropical wet forest* and *premontane wet forest*. This border in the life zone classification is characterized by an average annual precipitation of 4,000 millimeters and a mean annual temperature of 24 degrees Celsius. It is reasonably inferred from the location of the site on the map that the precipitation and temperature in the studied site are close to the figures shown above, although no data from actual measurements at the site were available. In terms of humidity, the life zone classification places the studied site in the *perhumid* category, the second highest of the nine.

Other geographic information was collected during the fieldwork. The nearest human settlement from the forest reserve was a village located one kilometer southwest. The village had approximately one hundred people and a primary school. This village was administered as a subdivision of a town located six kilometers south of the village. The town had about four hundred residents, not including the one hundred in the village. Major facilities in the town included a primary school, a high school, a general store, and two restaurant-bars. The town and the village, in combination, formed a community (*comunidad*). A large majority of the population in the community was immigrants from Nicaragua. The community had an association to discuss and carry out programs for its own development, including small-scale loans for supporting livelihood needs of the community members.

The studied forest reserve was remote from the rest of Costa Rica. The nearby community was slightly closer from any major town in the country, further limiting the frequency of visitation to the studied site from outside. Until the forest reserve of this case began to be used to host visiting tourists and volunteers, the area had been physically isolated, and not been used intensively.

Property arrangements

The information booklet prepared for tourists explains that the current owner, hereafter called Victor, purchased 110 hectares of primary rainforest in 1981. Victor came originally from former East Germany, and spent several years in Costa Rica as an executive of a multilateral financial institution. Grown up in a farmer's family, Victor had always wished to have his own farm, and thus his initial motivation was agriculture. His land, however, was far from San Jose or any other town, and very difficult to reach. Years passed without being able to use the forest land in any way until the idea of ecotourism came up in a conversation with a friend in 1989. The primary forest was set aside for conservation, accessibility was improved, and a lodge was built on a hill at the edge of the primary forest. Swamps that made this property hard to access became attractive lagoons to exhibit the wildlife. The first lodge was a small one with four rooms. After three years of the pilot phase with favorable feedback from the guests, Victor decided to upgrade the lodge comprising a couple of two-storied cabins. The total capacity grew up to 40 persons in 20 rooms.

Victor also acquired an additional 180 hectares of land next to the primary forest. This land became a farm growing hearts of palm (22 ha), a melina plantation (40 ha), and pasture (30 ha), and two lagoons (6 ha). The remaining 82 ha was left to natural regeneration of vegetation. Hearts of palm were used frequently as an ingredient in the meals prepared for guests at the lodge. A tree plantation was for sales of lumber and wood chips for pulp production. The pasture had cattle and horses grazing, but no production was operated on an industrial basis. These land uses were all small in scale, carried out for fulfilling Victor's personal wish rather than for making a large profit.

Having retired from his profession as a banker, Victor was also passing the management duties of the property to his son Carlos. Victor and Carlos, together with their wives, had a home in the suburb of San Jose. Victor visited the lodge once every month or two. As the tourism and other management duties in the site increased, Carlos chose to become the general manager as his sole job. He visited the site about twice a month in order to oversee the staff and work in general, as well as to pay monthly salaries to workers. Carlos also brought foods and other necessary supplies to the lodge and on the way back the garbage to city for disposal.

A new initiative was underway regarding the ownership of the forest land. Victor began to invite applications for a group ownership of his primary forest. The information material prepared for the guests explained that a new company had been established to issue a thousand units of shares, each of which were offered at the price of US$ 250. The company formed a board of directors with Victor being the president. Share holders would have the group ownership of the forest. One share

was equivalent to 1,000 square meters in theory, although in practice the ownership was not divided spatially on the land. This 100-hectare land was planned to be registered ultimately as ecological easement, a permanent commitment to the national government of Costa Rica to protect the forest.

The idea was to shift the individual property to group property, and to secure forest conservation on a permanent basis. A majority of the co-owners would be interested outsiders who find it important to protect this primary forest, not the community members. Carlos told me that the challenge was to find a sufficient number of people to make this arrangement work. The price of a share package had actually been reduced to US$ 250 from US$ 1,000 of the initial stage when nobody bought shares. After about five years, Victor's call for co-ownership was still active on the website as of August 2009, indicating that at least some shares were still available for purchase.

Tourism as the main use of the forest

Tourism was the only use by humans on a regular basis of the primary forest in the studied site. The lodge had guests every single day during the five weeks of my stay. Most of them were from Europe or North America. According to my records on the origins of the guests during my fieldwork, 67% of the guests were from Germany, 12% from the U.S., 4% from Austria, and smaller ratio of guests from the Netherlands, Switzerland, France, the U.K., Belgium, Portugal and Canada (these numbers include neither the professional guides accompanying the tour groups, nor the few Costa Rican researchers conducting plant and insect evaluation in the forest).

On-site programs for tourists included hiking through the primary forest, a boat tour in the San Carlos River, horseback riding, and canoeing in the lagoons. The boat tour and horseback riding were optional for additional fees, while the forest walk and canoeing were included in the lodging price. The forest walk and the boat tour took place basically every morning after breakfast, guided by one staff person each.

In the forest walk, tourists received explanations such as the following: forests in Central America were generally younger than those in South America and Southeast Asia; scientists had identified more than 140 plant species in this primary forest; soil on the forest floor was quite shallow and wet, making the trees unstable and frequent tree falls thus prompted regeneration; and different plant species not only competed but in some cases thrived in symbiosis, including large trees hosting bromeliads hosting insects and amphibians. Examples of ways in which indigenous people used to live in a jungle were also described, including the use of a type of large vine for collecting drinking water and another type of fine vine for repelling insects, and the collection of poison from frogs for applying to darts used to hunt animals. Examples of the wildlife which I encountered in the forest were three species of monkeys ("howler", "spider", and "white-faced"), two species of poison dart frog ("green and black" and "strawberry"), two types of macaws ("scarlet" and "great green"), snakes and agoutis. The forest was naturally a bird haven. The most spectacular (and noisy) types were the parrot family. Scarlet macaws and great green macaws were observed in and around the forest.

The last part of the guided walk was for seeing the surrounding land uses. Participants walked on a trail along the edge of the forest, passing by the farm, tree plantation, pasture and lagoons. On lucky days, macaws were found along the way. The pasture was basically an open grass field, but with several standing trees of tropical almond (*almendro* in Spanish). This tree produces high-value lumber, one of the reasons for rapid deforestation in the region. When Victor acquired the land, the pasture had already been clear cut. Only the tropical almond trees remained standing. According to Carlos, their hard trunks saved themselves in this case, as cutting them was formidable work. These trees had grown to be as tall as 30 meters from the ground, on which the macaws were

frequently observed. It was easier to spot macaws in the pasture with isolated trees of the tropical almond standing, than inside the dense forest where we could only hear them.

The boat tour started from a ramp on the shore of the San Carlos River, about fifteen minutes' drive away from the lodge. The boat had an engine and a simple roof, with the capacity of ten passengers. It was owned and operated by a man living in the town, who was called the "captain" in the tour. The boat made its way northward to the point where the San Carlos River flowed into the San Juan River. The San Juan River is the border between Costa Rica and Nicaragua. A variety of birds, crocodiles, turtles and bats were frequently observed from the boat.

The northern shore of the San Juan River was deeply forested, and part of a large protected area in Nicaragua called the Indio – Maiz Biological Reserve. A building of the Nicaraguan border guard was visible on the far shore. The Costa Rican side also had officers in a little building on the southern side of the river. This border guarding post was in a little village, where the tour group landed for an hour or so. Tourists walked to glance at the village, which had a handful of houses, a school, a little building that would become a clinic with doctors occasionally visiting. There were also two restaurants, which would become bars (and dance halls) at night for the villagers. The tour group visited one of them for refreshments. Alcoholic and soft drinks, as well as a cooked food using freshwater lobster caught in the river, were available. According to the local residents, the border was full of tension in the 1980s when Nicaragua was in a civil war. A majority of the residents in this border village, according to the villagers, were immigrants who had fled from Nicaragua in the civil war period. I did not observe tension during my fieldwork between the two sides across the border. The border guards and the residents who were now legal citizens of Costa Rica appeared to be getting along with each other, too. This village had much closer contact with tourists than the studied community did. Participants in the boat tour visited the bar/restaurant on a daily basis, and the sales of drinks and sometimes foods for tourists contributed to the household economy. After the stop at the village, the boat embarked on a returning trip to the starting point along the same course of the river.

Finance had always been a major challenge for the maintenance of the reserve. The main economic benefit of the reserve was the revenue from tourism. It took years for the tourism business to become profitable. Another source of income was the government payments for environmental services. But the amount of payment for the primary forest was less than 3% of the tourism income, which Carlos described as "better than nothing." In other words, the payments for environmental services were a tangible token of support from the government for conservation, but could never be a sole incentive for forest conservation. Another fact was that Victor always had a steady and well paid profession elsewhere during the early stage of forest and lodge management. Tourism was an unprofitable side business, at least for the first several years, and forest protection was due largely to Victor's personal values, rather than to economic calculations. Victor emphasized the difficulty of financing an individually owned reserve, saying: "Those NGOs can design projects and apply for external funding, but individual business owners like us cannot; we must make profit by ourselves." The on-going shift to group property was expected to broaden funding options. Guests at the lodge were potential buyers of shares, who would become co-owners of the forest reserve. In order to encourage conscious guests to get involved closely in conservation of the forest reserve, a discount was offered to share holders in their use of the lodge.

Surrounding areas

Land use patterns in areas surrounding Victor's property were another issue of interest. The most important property nearby, in terms of conservation, was a 400-hectare primary forest adjoining the reserve of this case. The two forest areas together formed one unit of 500-hectare

primary forest. The owner of this neighboring forest was a Costa Rican, who was also the owner of a large poultry business. According to Carlos, this owner was “simply happy to keep the forest there.” By the time I visited the site for the second time, however, this owner had just sold his company and the ownership of the forest to a Costa Rican-based financial group, suddenly and to Carlos’s surprise. This demonstrated how tenuous individual property as a structure for conservation could be, even where an owner was interested in conservation. The fate of this forest was not certain.

Another place to note was a new lodge which had just opened, located approximately two kilometers from Victor’s lodge. The owner had a previous experience of restaurant business elsewhere in Costa Rica. In addition to two hectares of land with four riverside cabins and a garden, the new lodge had approximately 300 hectares of primary and secondary forests combined. Maximum capacity of the lodge was twelve guests, although construction was underway for five more cabins. The total capacity would increase up to thirty guests. Tourist activities offered and prices were similar to Victor’s lodge. Carlos told me that the new lodge was a collaborator for them, rather than a competitor, in bringing more tourists to this area where tourism was still operated in a small scale. I saw Carlos and the owner of the new lodge meeting in person to discuss how to attract potential visitors. The owner of the new lodge only spoke Spanish, which was undoubtedly a handicap. He did not have effective means of reaching the tourism market either. Carlos was giving advice on production of a brochure and a website.

The new lodge was also welcomed by the community members. Most importantly, it provided additional jobs for local residents. At the time of my fieldwork, four people besides the owner himself were working at the new lodge. The owner also helped the community members in their daily life by bringing foods and other necessary goods in his car when returning from business trips to distant towns.

Significance of the forest reserve for conservation

According to Carlos, almost 140 plant species have been identified in the primary forest of this case. It also served as habitat for two species of poison dart frog, agouti, tapir and three species of monkeys, and many other species of wildlife. No scientific document inventorying all species of flora and fauna was available, but many of them mentioned above were observed frequently in the walking tour.

The studied forest reserve was 110 hectares, a size not necessarily large by itself for biodiversity conservation. Connectivity with its surrounding areas, therefore, was an important issue. The adjoining primary forest (400 ha), the other forest area (300 ha) owned by the owner of the new lodge, and the studied forest reserve were all within the San Juan – La Selva Biological Corridor. The total area within the corridor’s boundary was over 200,000 hectares. Costa Rica was proposing to acknowledge a total of fifty biological corridors in its territory, and the San Juan – La Selva Biological Corridor was included in the list (SINAC-MINAE 2003). This corridor was an initiative led by conservationists using the endangered great green macaw as the flagship species for protection. Listed in the most endangered category (Appendix I) of the Convention of International Trade in Endangered Species of Wild Fauna and Flora, this parrot species’ habitat had been rapidly diminished by deforestation; the decrease of forests with trees of tropical almond was especially critical because the great green macaw depends largely on this tree for both nesting and feeding (Chassot and others 2006). Conservationists were arguing for the protection of the region’s forests and their enrichment with tropical almond trees. With much of the surrounding areas deforested for pasture and other uses, the remaining patches of forest were playing a critical role as wildlife habitats. The studied forest reserve was one of those remaining habitats.

There was a proposal to establish a national park as a core protection area within the biological corridor. Carlos Manuel Rodriguez, then Costa Rica's Minister of Environment and Energy, made a comment supporting the idea of creating that national park at a meeting held in April 2004 at the headquarters of the Tropical Science Center in a suburb of San Jose. He said the proposed park could become a new type of national park similar to the Biosphere Reserves that classify zones for absolute protection, buffering, and sustainable resource use. The purpose of the proposed national park would be to secure existing property rights while preventing further deforestation. Some lots of land would be acquired by the government, but not all. The park thus would be an area combining various properties.

The park proposal was later modified and realized with the establishment of Maquenque National Wildlife Refuge in 2005 (Critical Ecosystem Partnership Fund 2005). The wildlife refuge was an already existing scheme of protected areas in Costa Rica, where mixed property arrangements and mixed objectives ranging from preservation to sustainable use are covered. Within the approximately 54,000-hectare Maquenque Refuge, local farmers and communities were encouraged to grow and harvest non-timber forest products including medicinal plants, fruits and seeds; to undertake reforestation with native trees; and to enhance programs of environmental education for raising awareness and reducing poaching in the forest (Chassot and others 2006).

Environmental impacts of tourism

The 110-hectare primary forest was basically used only for guided tours offered to the guests of the lodge, and exposed to no extractive use. Impacts of ecotourism, nevertheless, should be assessed. The studied forest reserve was individual property, where the owner basically had an exclusive control in terms of usage. Only the guests and staff were allowed to enter the forest. The number of visitors into the forest seldom exceeded ten per day. Excessive visitation was not happening. Because Victor was determined to keep the forest protected, no immediate danger of deforestation was likely to occur. Another issue in practice was whether encroachment and poaching were present. Such acts could threaten the effectiveness of forest conservation. In the studied forest, encroaching by outsiders was made difficult to attempt by the existence of the surrounding farm. There were usually workers in the farm, who were locally hired. If suspicious people were sneaking into the forest, or significant changes were occurring in the forest conditions, these were likely to be noticed by the workers or the lodge staff. The ecotourism impacts on the forest reserve appeared to be limited, judging from these points.

Other environmental conditions were also kept reasonably clean. As for the water, there was a natural spring four kilometers upstream of the creek, and a well within the property. Both sources of water were used at the lodge, except for drinking. Bottled water was brought from town and consumed at the lodge. Sewage was received in a septic tank under the ground. The tank was vacuumed once a year by a contracted company. Solid waste was sorted and brought to San Jose by Carlos, while organic waste was composted. There was basically no sewage or solid waste discharged into the natural environment around the site.

There were two times for feeding the wildlife. One was the feeding with chicken meat for several individuals of caiman, a variation of freshwater crocodile, and mud turtle, done around eight o'clock in the evening. This was an after-supper activity conducted every other evening by the night guard of the lodge for entertaining the guests. He explained he could identify several caimans, named them and almost without fail managed to bring them onto the shore. He sometimes approached the caimans and touched their back. The other time for feeding the wildlife was every morning, when two feeding spots were prepared for birds, right in front of the dining room of the lodge. A variety of birds came to these spots to eat bananas placed every morning. Other animals

such as coati and green basilisk were also observed to eat bananas on the feeding spot from time to time.

No scientific study was found to exist, regarding the impacts of these two feeding practices in this site. My observation was that the feeding was limited in terms of time, frequency and quantity. It appeared that the animals and birds could not depend totally on the feeding by the lodge staff. One exception was a keel-billed toucan being fed by the lodge staff every morning and afternoon, which was tame enough to play a role like a mascot character. The lodge staff recalled the driver of a van transporting tourists regularly to the lodge found the bird as an infant without parent, and brought it to the lodge. This individual did not seem to mix with other toucans, making the lodge staff believe that it would not be able to survive without human care for the rest of its life. When visiting the lodge for the second time, I didn't see this toucan and asked the lodge staff about it. The answer was that it had suddenly disappeared from people's sight. The fate of this bird was unknown; it might have been eaten by a predator, or died of an accident or disease. A romantic imagination of the lodge staff was that it had grown up and chose to join the toucan community.

The points mentioned above made it a reasonable synthesis that the negative environmental impacts of ecotourism in the studied site were limited and under control.

Contribution to community development

Victor and Carlos had contributed to the well-being of the people in the community in several ways. One of them was the development of infrastructure. The gravel road, though not paved, was a critically important means of transportation connecting the community with outside. The river used to be the main channel of transportation until the construction of a hydroelectric dam in Lake Arenal. This dam made the downstream of the San Carlos River too shallow to be a transportation route. Furthermore, the national electric power company (*Instituto Costarricense de Electricidad*) did not keep the promise of improving the roads in the affected area, according to Carlos. Negotiation resulted in partial success, with the narrow gravel roads constructed. These roads were not totally safe, however, particularly in the wet condition. An extreme case I encountered was a hole suddenly appearing one day, which was so large that a car could possibly fall into it completely. No light was there to illuminate the road at night either. With smaller holes regularly appearing, while tourists drove rented cars frequently, the safety concern always existed. Continuous negotiation for maintenance and improvement of the road network with the authorities appeared necessary, to which the forest owner could contribute on behalf of the community and the tourists.

The tourism business also helped the community to gain electricity, according to Victor. The owner family persuaded national electric power company to extend the network of power lines to the lodge via the community. My interviews with the local people revealed that they wished to have telephone lines. There was a phone at the lodge, which the guests, staff and local residents could use by paying the fees to the front office of the lodge. The location of this phone was too far and inconvenient for the villagers to use regularly, however. At the time of my fieldwork, there was no sign that wireless phones would be introduced soon in the area. Victor and Carlos, therefore, said they were trying to help bring a telecommunication network to the community widely. The development association of the community was an important arena, where the members discussed the needs of the community, some of which Victor and Carlos helped realizing.

The most direct and positive of the socio-economic impacts of the forest reserve and the lodge operation on the community were the jobs created. Almost all staff positions at the lodge were recruited from the local community. There were six positions on a full-time basis in cooking, cleaning, guiding, garden management, facility management, and guarding during the night time. A few part-time positions became available in busy periods, which were also filled by local people.

Eight local people were working at the time of my fieldwork, which was a busy season, including three women. Victor also hired several local men in his farm (and occasionally in the tree plantation).

The chef at the restaurant of the lodge, hereafter called Alberto, played a particularly important role supporting the lodge operation. He knew the lodge, the forest, the farm, and most of the management details in the site. Alberto's personal history itself was an example of how the forest ownership helped raise the well-being of local people. Coming originally from Nicaragua in search of work, he ended up in San Carlos. Not so good at physical work in the farm or construction, according to Victor and Carlos, Alberto demonstrated by chance his rich talent in cooking, when preparing meals for workers. When the tourism business began, Victor named Alberto to become the chef of the lodge and provided a training opportunity at a restaurant in a town. Dinner served at the lodge became a major tourist attraction by word of mouth. One German guest offered to fully sponsor Alberto's three-month stay in Germany to cook authentic Costa Rican dishes there, while broadening his world views, learning German in conversations, and experiencing German culture and cooking for further improving his knowledge and skills.

Domingo was another example of career development. Coming from the local community, he was hired as a tour guide after his predecessor resigned in order to start a guiding profession elsewhere. My observation was consistent with the evaluation by Carlos that Domingo was an excellent guide, spotting many kinds of wildlife during the forest and boat tours. He was improving his English through his daily work, too.

Aside from the positions hired directly in the lodge, tourism operated by Victor and Carlos supported other local businesses. The boat tour was a venture business by a man living in the town. Speaking only Spanish, he would not be able to attend the tourists, or even find and reach the market. Only by the partnership with Victor's business, the boat tour would have been feasible. The collaboration with the lodge was a key to start and succeed in the boat tour business. The tour business was going so well that a second boat was under construction.

Another example of such assistance was the training for young staff persons to gain business skills. The first wildlife guide of the lodge was sent to study English in San Jose. He developed his skills to be an excellent guide, as assessed by Victor, but later resigned in order to start his own business of canoe tours. His younger brother succeeded the guide position, and was trained in the same way. This brother also resigned later to help the canoe business. Victor and Carlos didn't intentionally design the guiding job as an entry to other professions in the lodge or elsewhere. But they accepted and supported the brothers' decisions, instead of considering them betrayal after all the investment for their training. The lodge kept a friendly relationship with the brothers and their family, too. The boat ramp in fact was in this family's property, and the boat tour of the lodge continued to use this site. The canoe tour was advertised to the guests of the lodge with leaflets piled in front of the main office, showing that Victor and Carlos were helping the brothers' new business.

Victor and Carlos also brought groups of volunteers from high schools in the United States. This program was made possible through Victor's affiliation with an international business association. The participating students stayed at the lodge in order to not only enjoy the natural environment but provide labor for the community needs. During my second visit to the site, one youth group was staying there. The students accomplished the task of re-painting the local school buildings.

There was another new initiative under trial. One tour guide bringing German tourists to the site several times was offering a short tour visiting the community, including the local elementary school. The purpose was to provide the tourists with an opportunity to experience local ways of life,

instead of passing it by in a tour van. During the trial period, many tourists donated money to help the school, which was in constant need of funds to purchase materials for students. The new program was an attempt to connect regular tourists and local residents in a more direct way. Impacts of this program, if adopted on a regular basis, were not certain yet.

Judging from the comments I heard from community members, the lodge staff, and Victor and Carlos, all of the initiatives mentioned in this section resulted from cooperative relationships between the Victor-Carlos side and the community side. Carlos in particular had established strong rapport in the community. I saw at the local bar the community members inviting him to sing karaoke together. On another occasion, one community member described his positive and relaxed personality using a Costa Rican common expression of "*pura vida*".

Employment structure and the sense of ownership

One full time position of the lodge was not locally employed; the operation manager position had always been filled by a European. The operation manager resided in the lodge to supervise the day-to-day work. This position was necessary because Victor and Carlos were based in a suburb of San Jose, not in the lodge. Despite their regular visits to the lodge, there was a clear need to have a full-time manager in the site. A required qualification was proficiency in three languages, Spanish, English and German. The operation manager had to be able to communicate with the tourists from Germany, the United States and other countries, as well as Costa Rican agencies, tour guides and the local staff and community members. According to Alberto, most of the past operation managers stayed there for a year or two. When the position became vacant, a notice of recruitment was posted on the World Wide Web.

Because this was a private business, important decisions like the hiring of a new operation manager were made by the owner with basically no participation from the community members including the full-time staff of the lodge. The operation manager coming from outside was the boss (*jefe* in Spanish) to all the locally hired staff. Having an outsider at the top of the staff hierarchy, according to my observation, had an effect of maintaining the order among the staff: like it or not, the local staff had to obey the manager. The local staff had no choice but to adjust to the mentalities and expectations of each incoming manager. The limited participation in management decisions by the local staff and community members was normal for a private business and thus reasonable in this case, too. It appeared, however, to have resulted also in a limited sense of ownership among the local people regarding the forest reserve and the tourism business. I suspected that an enhanced sense of ownership perceived by the local community members might become a factor raising the staff's morale and further strengthen the cooperation between the owner's side and the local side. This interpretation results from my observation that a majority of the local people saw the forest reserve and the lodge as outsiders' projects, rather than their own.

One possible breakthrough might be hiring the operation manager from among the local residents. The facility manager in charge of maintaining the buildings and associated facilities at the lodge had a son doing well at high school. This boy was born and raised in the community, while the father was an immigrant from Nicaragua. The community's hope was that, with appropriate post-secondary trainings in languages and business administration, he could be qualified to become an operation manager eventually. In case of this scenario actually realized, the forest reserve and the ecotourism business might become closer to a co-ownership with the community being the key partner.

The fieldwork

This section summarizes other stories of the fieldwork and my observation of the lifestyle in the studied site, in order to provide richer context for this case study. The studied site came to my attention while I was searching for suitable cases. My e-mail inquiry to acquaintances in Costa Rica was forwarded to other people including Victor, who sent me a message describing briefly his forest and related activities, and offering to cooperate with my research. At my first meeting with Victor and Carlos in person in San Jose, they heard and understood the research objective, and explained their projects in more detail. This meeting helped my judgment that this case of individual property would provide a useful comparison with another case of common property. Our agreement was that I would stay in the site as a volunteer at the lodge, working in the morning as a tour guide and in the evening as a waiter at the restaurant. The afternoon could be used for personal matters including research. There had previously been other volunteers at the lodge in similar arrangements, according to Victor.

A few days after the meeting, Carlos took me to the lodge on one of his regular trips driving his van with supplies of foods and other daily necessities. Carlos's wife also accompanied the trip, who was a lawyer taking care of legal matters of the family business, according to their explanation. The trip was about four hours' drive up and down, from Costa Rica's central valley to the mountain range, and ultimately to the lowland. The road was paved in some parts of the route, though not in other remoter parts. The time we spent together in the van was informative. Upon arrival at the lodge, I was introduced to the staff people. My first impression was that the staff people were working with enthusiasm, and the lodge was being run in a coordinated order.

From my second day at the site, I was asked to guide either a forest or a boat tour every morning. I received only one training session for each tour, before starting to guide. The timing was unexpectedly early and I didn't feel prepared sufficiently. This was when the techniques for participatory exercises that I had learned as preparation for field research were found useful. Instead of the guide always giving instructions, I encouraged the tour participants to share their knowledge and thoughts with others. Each day brought new discoveries from an abundance of topics in the tour.

The lodge staff were also important informants as I spent much time with them. Alberto particularly helped me become familiar with the local people and the area including less traveled parts of the forest. He frequently shared his knowledge and views on the management of the forest and lodge as well.

I visited the community when I had time to do so, in order to talk with the local people and learn their lifestyles and perceptions. Not much time was needed for ice-breaking, because the lodge staff comprised members of most of the few households in the village. The villagers, therefore, had a close relationship with the lodge business, and they had already heard about me as well. A frequently heard reply to a question of what they were up to was "*Paseando*" (rambling). They were visiting each other to chat: that was the main entertainment in life, especially for women. This typically occurred in the afternoon when women could take a little break from the chores at home. Looking after their children together and avoiding the heat of the day, it also functioned as an important channel of communication among the villagers. There were three little shops (*pulperias*) in the village selling drinks, foods, cigarettes and other daily necessities. These were good spots to start my rambling.

After a day's work in the farm, some men had a few drinks and karaoke at a bar in the town. The lodge staff brought me there several times after finishing all the evening work around eight o'clock. Alberto was usually the one to organize such activities. Interacting with the local people at the bar, stores and other locations was an important means of observation.

Future prospects

In terms of forest conservation, the current land use in the studied site would probably continue. No sudden change was likely to occur, because Victor and Carlos were determined to maintain conservation-oriented management of the property. But the effects of the transition of the forest ownership to group property were not certain yet. The 400-hectare forest next to the studied forest reserve showed how tenuous individual property could be, even where an owner was interested in conservation. The effects of the establishment of the Maquenque National Wildlife Refuge were not yet clear either. In terms of the well-being of the local people, infrastructure including the road and telecommunication networks would be developed gradually. This would enhance the connection of the community with the outside world, increasing also the interactions between the community members and outsiders. Socio-economic impacts of these changes were not so visible yet. If research is possible in a longer term, these might be among the topics worth following up in the future.

Chapter 8: Characterizing Grassroots Initiatives for Conservation

Introduction

This chapter assesses the empirical findings from the Costa Rican cases, and explores their implications for the theory of common property and conservation. The forest reserve in Talamanca (Chapter 6) demonstrated the existence of actual cases consistent with the concept of common property protected area (CPPA). It was not possible to determine the exact number of CPPAs in Costa Rica, but the list of the network of non-governmental nature reserves indicated there were tens of other sites in Costa Rica that were likely to fit with the CPPA concept. The forest reserve in the county of San Carlos (Chapter 7), owned by an individual person, enabled comparison with the CPPA case highlighting shared and different characteristics. General profiles of these two cases are presented in Table 5.

This chapter adapts the set of preconditions and promoting factors proposed in Chapter 3 as a guide in assessing the case findings. They are clustered as: physical characteristics (boundaries, and area and connectivity); social capacity (community characteristics; goals and targets; and decision making); property rights and stakeholder relationships; and driving forces. The following sections discuss these criteria respectively, after which I summarize them in a tabular format. The chapter concludes with future research needs.

Table 5: Comparative summary of the two site-specific cases

	Talamanca	San Carlos
Type of property/ownership	Communal	Individual
Location	10km inland from the Caribbean/Pacific coast, south-eastern, close to border with Panama	Lowland in the north of Costa Rica on the Pacific slope, near the border with Nicaragua
Province	Limon	Alajuela
County	Talamanca	San Carlos
Area (size) of forest reserve	144 ha primary and secondary forest	110 ha primary forest
Government regulation	Clearance prohibited by the 1996 Forest Law, as applied in all natural forests in Costa Rica	Clearance prohibited by the 1996 Forest Law, as applied in all natural forests in Costa Rica
Land uses within property (in/around the reserve)	Tourism (lodge & trail); nursery; forestry (terminated) (all within the 144-ha communal property)	Tourism (lodge, trail, canoeing on lagoons (6 ha)); plantation forestry (40 ha); ranch (30 ha); growing hearts of palm (22 ha); natural regeneration of vegetation (82 ha)
Lodge capacity	Max. 29 guests	Max. 40 guests
Owners' income sources	Tourism (dominant); payments for environmental services; project funding	Tourism (dominant), payments for environmental services; sales of wood and hearts of palm
Adjacent areas for conservation	Gandoca-Manzanillo Wildlife Reserve (3833 ha in terrestrial part) located less than 5 km northeast to the reserve	Immediately adjacent to 400 ha of primary forest
Broader connectivity	Part of Talamanca-Caribe Biological Corridor; near Cahuita National Park and La Amistad International Park; Part of Mesoamerican Biological Corridor	Included in Maquenque Wildlife Refuge, core protection area of San Juan-La Selva Biological Corridor, which lies next to Indio-Maiz Biological Reserve of Nicaragua; Part of Mesoamerican Biological Corridor

Physical characteristics

The category of physical characteristics includes the boundaries, size and connectivity. They are perhaps the most basic preconditions in examining areas with grassroots conservation initiatives.

Boundaries

Clear spatial boundaries are regarded as an important precondition in the literatures on common property and protected areas, either explicitly or implicitly. Protected areas require clear boundaries because one of their main functions is to regulate the human intervention within the designated boundaries (Dudley 2008). There can not be protected areas if spatial boundaries are not clarified, although in some areas the boundaries might be subject to disputes between the governments and other property right holders. Common property regimes in general also regulate rights and rules among the members, as well as against outsiders. Spatial boundaries are an important foundation, therefore, on which rights and rules are specified (Agrawal 2002; McKean 2000; Ostrom 1990).

Both of the forest reserves studied had clear spatial boundaries. No example lacking clear boundaries in Costa Rica came to my attention either. A possible counter-argument is that clear boundaries are not necessarily important in a landscape with multiple property arrangements but similar environmental conditions and their management. However, not all properties in this landscape might sustain their current ways of use and management over the long term. Clear boundaries would protect the rights of continuing the conservation management practices even if neighboring properties change strategies, practices and land cover. It is reasonable to conclude from the literature and my experience in Costa Rica that clear spatial boundaries, or at least efforts to clarify them, are among the first requirements for institutionalizing common as well as individual property managing nature reserves.

Area and connectivity

Area (spatial size) is not as straightforward as the boundaries. A relatively small area has been listed as a precondition for effective management by common property, because otherwise a community might not be able to monitor the enforcement of rules in its common area (Agrawal 2002). On protected areas, scholars have come to different conclusions. Conservationists generally advocate for expanding the total area covered by all protected area schemes. A long-debated question was whether conservation would be better served, given a fixed total area of all protected areas, to have a smaller number of large reserves or a larger number of small reserves (Diamond 1975; Gilpin and Diamond 1980; Higgs and Usher 1980). Bücking (2003) shows an advantage of forest protection combining graduated threshold areas from small to large. For CPPAs, each area can be small but should be connected to broader landscapes.

Both reserves studied in this research supported this assumption. The area covered in the communal forest reserve in Talamanca was 144 hectares. The individually owned forest reserve was 110 hectares. They were small enough to keep a close eye on. In terms of conservation, these reserves may not necessarily be large. Both of them, however, had several adjacent areas with compatible land uses. The communal reserve in Talamanca was an important component of Talamanca – Caribe Biological Corridor. Likewise, the individual reserve in San Carlos was a formal part of the Maquenque Wildlife Refuge including not only state land but other types of property, as well as San Juan – La Selva Biological Corridor. A much larger initiative such as the Mesoamerican Biological Corridor comprises numerous segments of land, many of which are small. Connection to these surrounding landscapes enhances the chances that individual reserves will contribute to the conservation of a wider variety of species as well as providing more spacious habitats for migratory species and species with large territorial requirements.

Social capacity

The category of social capacity includes the community characteristics, goals of conservation and community development, and participatory mechanisms of decision making. The overall capacity of the local community is discussed at the end of this section.

Community

In terms of proximity, residences of the community members in Talamanca were relatively distant from the communal forest reserve, and the reserve was accessible only by foot on a long and difficult walk. The difficult access was probably the principal reason why the area had not been subject to intensive resource use. In other words, the current communal reserve had been left relatively intact as a forest because access was so difficult. The reserve managed as individual property in San Carlos was a more complicated situation. The owner family primarily resided in a distant city, although they visited the reserve often in order to bring supplies such as foods, as well as to oversee the operation. There is a resident manager based in the site to lead the day-to-day operation. People of the local community were not living in close proximity of the reserve. Except for those employed at the lodge, local people had little reason to visit the reserve. A synthesis of this research is that having residents nearby, but not immediately adjacent, to the reserve was the situation most conducive to a CPPA. This is a precondition particular to CPPAs, different from both the exclusionary model of protected areas and the ideal common property institutions respectively. Conventional protected areas tend to keep human populations away, while common property theory suggests that proximity, or even overlap, between local populations and common areas would promote the sustainability of the institution (Agrawal 2002). It can encourage a balanced care that is neither intensive use nor neglect. In order to come to a conclusion on the proximity for individual property reserves, more case studies would be necessary.

Regarding the level of poverty, both cases in this research showed no extremely severe poverty surrounding the areas in question. The forests did not have to be cleared because there were other livelihood options. In the case of the CPPA, the central livelihood for community members was small-scale agriculture carried on by each household. The owner in the case of the individual property had a high and stable income from a profession as a banker in the early years following the establishment of the reserve until he retired. There is a pending issue regarding poverty, however. Squatting, as well as illegal hunting and poaching, would threaten the ecosystems and the effectiveness of governance, although neither of the two case studies in this research was subject to such immediate threats.

At the national scale, the moderate level of economic development in Costa Rica appeared to be contributing to the conservation and sustainable use of natural resources. Combined with its policy priorities in peace, education and other social fundamentals, Costa Rica, as a middle-class country in the world economy, is able to pursue both conservation of nature and well-being of people at the same time. It also has access to assistance from governments and other organizations of the developed world. This is contrary to many other developing countries where such matters of life and death as wars, famines and diseases precede less salient issues like nature conservation. It should be noted, however, that not all the people in Costa Rica enjoy the middle class standard of living; immigrants for instance are often disadvantaged (Sandoval 2004).

In terms of dependence, each household in the Talamanca community held its own land as individual property. These individual landholdings and the communal forest were not adjoining. Crop farming and animal husbandry on the individual land fulfilled much of the subsistence needs for each family, as well as providing modest cash income. People did not depend upon the communal forest for subsistence. The communal forest, therefore, had not been subject to

intensive use. This was a finding that distinguished CPPAs from conventional institutions of common property managing natural resources, because common property theory generally assumes greater dependence on the use of resources makes the group members more concerned with the sustenance of the natural environment in the common area (Agrawal 2002). The case of the individual property reserve in San Carlos also showed that the owner did not depend on the natural resources in the forest reserve for subsistence. The forest was being used only for low-impact tourism. To summarize, low dependence on natural resources was found to be an important condition so that local residents did not depend on extracting an excessive amount of resources.

Other characteristics such as shared norms, mutual trust, skills and knowledge, as well as a well-developed institutional base were found to contribute to the grassroots initiatives in both cases, and the leadership of a key person was particularly influential. This was consistent with arguments in common property theory on the importance of social capital (Meinzen-Dick and Knox 2001). These conditions might have been reinforced by the process of undertaking grassroots initiatives, rather than simply as preconditions. The community in the Talamanca case had a tightly knit social fabric in sufficiently close proximity, where face-to-face interactions between the members facilitated collective decision-making and action.

Goals and targets

In the Talamanca CPPA, the community association had conservation and development clearly as its goals – indeed, the words *conservacion* (conservation) and *desarrollo* (development) were explicitly included in the association's title. The non-extractive use of the forest reserve principally for tourism was targeted toward these goals. The individual property reserve in San Carlos also targeted conservation of the primary forest, contributing to broader conservation efforts with great green macaws as the flagship species. By hiring local people as the lodge staff, it was contributing to the improvement of their economic well-being. The owner was also assisting in addressing the social needs of the community in several ways such as bringing young volunteers from abroad to provide the labor of painting the buildings of local schools. Though not manifested officially, flagship species and targeted activities were clearly identified in both cases studied.

Decision making

The communal case in Talamanca had a mechanism of participatory and adaptive decision making, particularly with the monthly board meeting to discuss important management decisions from strategies of accepting visitors to maintenance of facilities. In the case of individual property in San Carlos, management decisions regarding the forest reserve were made by the owner. Naturally, it was not a very participatory process but appeared to be a highly adaptive one to external forces such as fluctuation of the tourism market. When the forest reserve becomes full group property, stability in management strategies would increase at the expense of flexibility. For community development more generally, the owner was working in cooperation with the community's development association, through which socio-economic needs such as infrastructure development were addressed collaboratively. These observations supported the claim that participatory mechanisms for making decisions would encourage grassroots initiatives for conservation and development (e.g. Conley and Moote 2003; McKean 2000; Slocombe 1998).

Local capacity

Pretty and Ward (2001) categorize three stages of maturity in groups managing natural resources: a) reactive-dependence, b) realization-independence, and c) awareness-interdependence. A new group can be born as a response to a problem, with help from

outside parties. It may then grow to become a self-sufficient group to achieve its goals. A more advanced group may have members with high abilities of self-reflection and vision shaping, and such groups interact with each other to form federation. Although it is not easy to classify all cases in this way, the perspective appears helpful in assessing the general capacity of local communities in the two case studies.

The community in Talamanca, according to my interpretation, had its members in the realization-independence stage with its leader in the awareness-interdependence stage individually, although the level of interdependence was maintained at a moderate level allowing household livelihoods to continue. The community in San Carlos appeared to be in the realization-independence stage. If its members interact with external organizations more actively, coordinating the management of forest reserves, the community might advance to the awareness-interdependence stage.

A lack of local capacity is commonly thought to be one of the causes for degradation of the natural and social environment (Agrawal 2002; Ostrom 1990), and therefore, sound social capital in well-developed local groups is assumed to contribute not only to the well-being of group members but to nature conservation. My observations found that local capacity in both sites of the case studies had been advancing steadily to mature stages.

Property rights and roles of stakeholders

What are the property rights held by each of a range of stakeholder groups in the cases of CPPA and individual property reserves? One way to start this assessment is to apply and build on the seminal classification by Schlager and Ostrom (1992) of five types of property rights: access, withdrawal, management, exclusion and alienation. A different set of these rights is held by each of the stakeholder groups (Table 6).

Table 6: Bundles of rights held by stakeholders

Stakeholder	Rights held
Owner	Access, withdrawal, management, exclusion, alienation
Proprietor	Access, withdrawal, management, exclusion
Claimant	Access, withdrawal, management
Authorized user	Access, withdrawal

Source: Adapted from Schlager and Ostrom (1992)

Many scholars of common property have found this classification useful at the conceptual level for analyzing extractive resources (Rieser 1997). It provides a straightforward framework for identifying various types of stakeholders with different sets of property rights in actual cases (e.g. Grafton 2000; Yandle 2007). When applying it to the cases studied in this research, however, I found it necessary to modify the framework. For example, the types of rights in the framework by Schlager and Ostrom (1992) only presume extractive uses of specific resources. Even the authorized user, the stakeholder with the minimum range of rights, is entitled to withdraw resources. Non-extractive uses of resources are not considered in this framework. In contrast, both of the studied forest reserves had temporary visitors who were allowed to enter but not to extract materials. These tourists can be an important stakeholder group in a CPPA as well as an individual property reserve, and should not be overlooked, particularly where ecotourism prevails. A framework for analyzing CPPAs and individual property reserves needs to identify such a group

clearly. One way to modify the framework is shown in Table 7, in which the owner of an individual property reserve has all rights. The owners of a CPPA as a whole group also have a full set of rights collectively, whereas each member within the group cannot decide individually who can use the property and whether to sell it or not. External collaborators such as donors, conservation NGOs and volunteers can assist in the management of CPPAs and individual property reserves. Temporary visitors, when permitted, are able to enter the land, although their access needs to be supervised and therefore is a more limited right than that held by other stakeholders. This framework as a whole extends the analysis of rights in both spatial scale and range of stakeholders.

Table 7: Modified classification of the bundles of rights held by stakeholders

Stakeholder	Rights held
Individual property owner	Access, management, exclusion, alienation
CPPA owner (as a whole group)	Access, management, exclusion, alienation
Each member of a group owning common property	Access, management
External collaborator	Access, management
Tourist and other distant supporter	Access

A more general problem regarding the framework of Schlager and Ostrom (1992) is that it focuses only on rights. In many instances, rights exist in exchange for obligations or burden. Each stakeholder has rights (benefits) and obligations (costs). Furthermore, because stakeholders in CPPAs and individual property reserves are wide-ranging, their roles had better be clarified. Each stakeholder's role might be self-explanatory in locally and tightly structured property arrangements, as indicated in the framework by Schlager and Ostrom (1992). But for more complex stakeholder compositions like the cases studied in this research, each group's role deserves description.

The following describes specific stakeholders, as well as their roles, benefits and obligations, extending beyond the bundles of rights, summarized in an expanded tabular style. Such analysis can also help identify potential conflicts of interest between stakeholder groups, as well as shared interest for potential collaboration.

Stakeholders in the communally owned forest reserve

A wide variety of stakeholders existed in the communally owned forest reserve in Talamanca. The most central person was the president of the community association, with his family as the closest supporters. He was undeniably the leader of the community's collective initiatives for nature conservation and local people's well-being. Other members of the association were the next important players. Two persons, together with the president and his wife, formed an executive board of the association, which held monthly meetings to oversee the operation and make decisions on management. Some members of the association occasionally provided labor.

An important stakeholder outside the community was the non-governmental organization (NGO) called ANAI. In the studied community, the greatest contribution of this NGO was the assistance at the start-up stage. The nursery project with technical support, followed by assistance in forest acquisition, actually catalyzed the community initiatives.

Another important group was the administrative organization of the Talamanca – Caribe Biological Corridor, acting as an intermediary for forest owners applying for and receiving the payments for environmental services. The community association of this case study had a close relationship with the corridor administration. Talamancan Association of Ecotourism and Conservation was another local organization with an important role in the studied community and its forest reserve. The reserve and the lodge were central parts of one-day and two-day tours offered by this tourism association. In return, it was bringing tourists and cash income to the community association. These three groups, ANAI, the corridor administration, and the ecotourism association, were functioning as external collaborators.

There were other organizations not as strongly tied with the community association as ANAI or the Talamanca Association of Ecotourism and Conservation, but playing a part in the CPPA. One of them was the National Network of Cooperatives in Ecotourism, based in San Jose. The Network published a guidebook of community-based sites of tourism in Costa Rica, including the studied community. Several universities in the United States were also organizing study tours usually once a year and bring students to the studied forest reserve. Rangers of the national park system based in a local office near the studied community occasionally visited the community.

Stakeholder groups are listed in Table 8, with their roles, as well as their benefits and costs derived from involvement. This list may not be exhaustive, but covers most groups involved. It is an attempt to identify and illustrate the complex composition of players in the game.

Table 8: Stakeholders in the case of communal forest reserve

Groups	Roles	Benefits (incentives)	Costs (contributions)
President of the community association and his family	Leading the collective initiatives	Cash income, unity in the community, creative motivation by trying new activities; personal values of “belonging to land” as the farmers’ lifestyle	Labor and opportunity costs (the time not used for household activities, and the land not used for other purposes such as agriculture and forestry)
Other members of the community association	Participation in community activities	Cash income, unity in the community, creative motivation by trying new activities	Labor and opportunity costs (the time not used for household activities, and the land not used for other purposes such as agriculture and forestry)
NGO (ANAI)	Assistance for sustainable livelihoods of the community	One path to accomplish the organization’s objective; strengthening the ties with local communities	Manpower and expenses for operation

Groups	Roles	Benefits (incentives)	Costs (contributions)
Talamanca – Caribe Biological Corridor (and its administration)	Connecting the reserve with larger areas for protection	Inclusion of a site in the corridor	Provision of technical assistance
Talamanca Association of Ecotourism and Conservation	Collaboration with local tourist sites for packaging and marketing of tours	Having an important member of association and destination	Operational costs
National Network of Cooperatives in Ecotourism	Promotion of community-based ecotourism in Costa Rica	Having a suitable site for the guidebook; receiving fees for publication	Operational costs
Government park authorities	Managing adjacent wildlife refuge	Implementing conservation policy	Operational costs; efforts to attract political priority
National Forest Finance Fund	Providing eligible forest owners with direct payments for environmental services	Implementing PSA policy	Budget for human and other resources; efforts to attract political priority
Foreign universities	Visitation for field studies	Having a suitable site for field studies	Travel costs
International NGO (conservation)	Owning adjacent forest land for connectivity	Implementing activities to support good conservation practices	Operational costs
International NGO (Rainforest Alliance)	Issuing SmartWood certification for sustainable forestry	Implementing the program and promoting its own certification scheme	Operational costs
International NGO (Funding and web)	Providing funds and support in publication for the initiative	Implementing activities to support good conservation practices	Operational costs
International NGO (educational)	Bringing youth volunteers	Use of the site for education	Operational costs
Volunteers	Providing labor and other assistance	Personal fulfillment and experience	Time; travelling and living costs
Tourists	Bringing money to the host communities;	Personal enjoyment; learning the local ecosystems and cultures	Time and costs for travelling

Stakeholders in the individually owned forest reserve

The San Carlos case of individual property had a similar structure. The most central group was the owner and his family. This family was not originally from the local community. The owner's contribution to the local community, however, had been wide-ranging. The community members

acknowledged the contribution, making the ties stronger between the owner's family and the community. In terms of the use and management of the forest reserve, the next important group was the staff of the lodge. The staff workers were recruited from the local community, and they were the ones to take care of the daily operation of tourism and maintenance.

Outside of the forest reserve, the farm within the same owner's land also created employment opportunities for local people. The community as a whole had its development committee, which functioned as an official forum to discuss the needs of the community. The owner of the forest reserve was a member in the committee. This case showed that individual property reserves can contribute to improving the well-being of local people.

Conservationists and scientists, both domestic and international, made occasional visits to the forest reserve. They were studying, assessing, and publicizing the ecosystems found in the reserve, depending on their missions. These and other stakeholders are identified in Table 9.

Table 9: Stakeholders in the case of individually owned forest reserve

Groups	Roles	Benefits (incentives)	Costs (contributions)
Owner	Owning and managing	Profit, personal fulfillment and values	Investment for land acquisition, labor and opportunity costs in household labor and other land uses
Staff	Serving the guests; maintaining the facilities	Income, personal fulfillment	Time for labor; opportunity costs (agriculture, etc.)
Community development association	Friendly relationship, giving opinions	Visitation by outsiders (sales at bar/restaurant – very modest)	Visitation by outsiders (possible cultural impact – little observed)
Conservation NGOs and scientists	Conducting research; advocacy for conservation	Conservation	Time; human resources
Government park authorities	Policy formulation for conservation areas in general	Conservation; expansion of PA system, hence budget	Possible budget allocation
Government tourism authorities	Certifying sustainable tourism	Promotion of ecotourism	Operational cost; efforts to attract political priority
Ecotour guides	Introducing tourists to the area	Income; working with nature	Risks of accidents and trouble with clients
Tourism agencies	Bringing tourists	Promotion of business	Operational costs
Foreign universities	Spending money; studying	Gaining knowledge; field experience	Time; travel costs
NGOs	Bringing youth volunteers	Use of the site for education	Money and arrangement
Volunteers	Assistance in daily operation	Experience,	Time; travel costs
Tourists	Spending money	Experience	Time; travel costs

Driving forces for conservation at the grassroots level

Driving forces in this case mean factors that support the emergence, maintenance, and/or expansion of grassroots initiatives for conservation and community development. Laws and other regulations can be powerful forces to guide decisions of individuals and groups. Norms and values held by individuals and society may also work as driving forces. Another key incentive is economic gain.

An important question is how strong the linkage is between conservation and local livelihoods in each case. Salafsky and Wollenberg (2000) categorize three types of relationships between conservation and local livelihoods, depending on the degree of linkage between the two. A first

category is *no linkage*, of which the most typical example is a conventional national park that excludes local people. A second category is *indirect linkage*, an example of which is a buffer zone that allows some livelihood activities while securing preservation in core protection zones. The third category is *direct linkage*, where conservation and livelihoods improve each other. The stronger the linkage is, the more both goals are likely to be achieved, at least in theory. In reality, an appropriate combination of incentives should be designed in order to suit unique situations (Salafsky and Wollenberg 2000).

In the Talamanca CPPA, the president of the community association mentioned the importance of "belonging to land" as a goal in life placed higher in the order of priority than increasing income. In the case of the individual property reserve in San Carlos, the owner's initial motivation was also practicing small-scale agriculture. My interpretation is that these motivations resulted from non-material values of a specific way of life in a specific land. A sense of attachment to place as well as esteem for the farmers' way of life drove the grassroots conservation initiatives. Natural resources are "not just raw materials to be inventoried and managed as commodities, but also, and more importantly, 'places with a history, places that people care about, places that embody a sense of belonging and purpose that give meaning to life'" (Williams and others 1992, cited in Williams and Patterson 1996, 518). Affection for a particular place and a particular way of life might outweigh the opportunity cost for potential cash income. Both of the case studies supported the argument by Langholz and Lassoie (2001) that personal values are a more significant motivation than income generation.

I concluded that the linkages between conservation and livelihoods were indirect but highly compatible in both of the cases studied. The most influential of the driving forces identified in both cases were the non-material values. Although economic gains from ecotourism and the payments for environmental services facilitated and encouraged conservation, none of the economic benefits influenced the decisions in these case studies as much as the personal values did. No other kind of incentive such as bioprospecting contracts was found in either case. That said, economic incentives through ecotourism and payments for environmental services should be discussed in more detail.

Ecotourism

At the national scale, tourism in Costa Rica has grown rapidly during the past few decades to become the nation's top industry. Costa Rica is known as a pioneer in ecotourism pursuing both conservation and economic development (Brockett and Gottfried 2002; Evans 1999; Van der Duim and Caalders 2008). There were high expectations particularly during the 1980s and 1990s, that tourism could be a powerful means for economic development despite the risks of negative impacts on the environment, society and economy in the host countries (Brohman 1996) So-called pro-poor tourism could help reduce not only poverty in general but also equity among the population (Schilcher 2007). Ecotourism has been one of the major alternatives to conventional mass tourism. Does ecotourism actually achieve symbiosis between tourism (as an industry) and conservation, as Budowski (1976) proposed? At the national scale, Costa Rica's achievement should be acknowledged, although closer examinations at the site level have shown mixed results (e.g. Campbell 1999; Place 1998; Weaver 1999). Examination of both positive and negative impacts of ecotourism enables an overall assessment as to whether ecotourism has net benefits or not (Figgis 1993), which should be done in physical/environmental, economic and social dimensions (Mathieson and Wall 1982).

At the scale of the local community, a hypothesis is that a community, with sufficient capacity and using appropriate techniques such as workshops and focus groups to facilitate participation of

its members as well as other stakeholders, would succeed in tourism-based sustainable development (Aref and others 2010; Jamal and Getz 1995; Murphy 1988; Simmons 1994; Wilson and others 2001) The diversity and dynamic composition of the community needs to be considered as well (Taylor 1995). There is a structural imbalance of power that limits local control of tourism industry (Blackstock 2005). Discrepancy of perceptions is also reported to exist between local people in destination communities and outsiders such as ecotourism operators and guides, because the typical ecotourism discourse originates from the West, white, middle-class, post-industrial and professional class, according to Fletcher (2010). People in this class seek for unusual experiences in the wild land, where local people living their lives and cannot easily understand the motivation of these visitors. The outsiders bring their own values to destinations unconsciously. Some of them try to proselytize their environmental values among local people, which can sometimes discourage collaboration between local and external groups (Fletcher 2010).

In the case of the communal forest in Talamanca, ecotourism was a major incentive for the community to maintain its forest reserve. It was a source of cash income, necessary for house construction and maintenance, children's schooling, and purchase of some foods and daily necessities. The community sought livelihood but not necessarily capital accumulation: this is probably this dissertation's most important finding regarding common property protected areas. The relatively low intensity of tourism operations in this site could seem like the result of a lack of marketing effort, to the eyes of outsiders. As I understood better the local contexts and values, it became clear that the growth management was their preferred choice. The highest priority for the people in the community was to maintain small-scale agriculture in each household at the core of their lifestyle. They were carefully striking a balance between household activities and collective projects. An overuse of the forest reserve was thus avoided as a consequence. There was no severe negative impact of tourism on the natural environment. Encountering outsiders in the forms of tourists and volunteers was providing opportunities for the community members to rediscover the social and environmental values in the site, which could be a positive social impact. Economic impacts were also moderately positive, and maintained at the level preferred by the community members. This strategy was a result of participatory consultation within the community, as well as with outside collaborators.

Generally speaking, a host community dependent largely on tourism would be affected greatly by political, economic and other external conditions (Langholz 1996). In the studied site in Talamanca, the relatively low dependence on tourism, as well as the high level of local control, kept the community from being totally vulnerable against such risks. The community's management of growth did not mean that the community was reluctant to maintain the tourism project. The new initiative of introducing the style of farm tourism was a signal that at least some of the community members were willing to connect the household livelihoods with tourism more closely. This would result in an increase in cash income while assuring livelihood activities at each household. This can be described as a shift from indirect to more direct linkage between livelihoods and conservation, as defined by Salafsky and Wollenberg (2000). The people in the community had certainly been exposed to outsiders' norms for conservation, but the local way of life was being prioritized and maintained.

In the individual property reserve in San Carlos, the owner's initial purpose of acquiring the land was not tourism, but practicing agriculture. The tourism project was undertaken later, combined with small-scale agriculture and forestry. Tourism remained only one component of the package. Thanks to another stable profession, quick profit-making was not a top priority. Tourism became a profitable business after almost 10 years in deficit. In all this time massive expansion was not on the table of planning. The number of rooms in the lodge limits the maximum number of daily visitors, controlling the impacts on the reserve and the environment. Solid waste and sewage were

not discharged into the natural environment, either. The ecotourism business created employment opportunities for local people, particularly for women who would have limited chances to find paid jobs within their community. The owner's family maintained a good relationship with the community. Normative and economic values of conservation were not necessarily endemic in the local community in San Carlos. It is the owner family that brought such values from outside. The owner was also contributing as the liaison in negotiation with authorities for infrastructure development, for example. The ecotourism project also brought youth groups to spend their holidays for volunteer work such as painting the school buildings. Social impacts had been low because there had been limited chances of encounter between the local people and tourists from outside. Observation over a longer term would be needed, however, to track the social impacts of increased contact between the local people and outsiders. Other techniques of collecting and analyzing data, including participatory evaluations, would also enhance the robustness of the findings based on my anecdotal observations, one of the limitations in this research.

In both cases, the central property right holders had clear objectives of harmonizing the improvement of people's well-being with the conservation of nature. There were outside groups supporting the initiatives, but the core stakeholders kept the initiatives under their own decisions and control. These decisions resulted largely from personal and cultural values. By carefully managing growth as Gill (2000) describes, the visitation level in the studied site was stable. A dynamic trend like Butler's (1980) tourism cycle had not occurred so far at least. The findings also indicated that the role of tourism in reducing poverty was not so easily understandable, because tourism was developed in complex mechanisms with many actors involved. This reflection was consistent with the conclusions reached by Van der Duim and Caalders (2008).

As many operators advertise the tours they offer as ecotourism, quality control becomes important. Certification is one way to promote sustainability. The first national ecotourism accreditation scheme in the world was established in 1996 in Australia, requiring three steps: 1) self-assessment of compliance with the preset criteria, 2) evaluation by three qualified referees, and 3) approval or rejection by the accreditation committee, thus making the scheme more accountable and enforceable than voluntary codes of practice (Wearing and Neil 1999). The key roles of eco-labeling in tourism identified in a study of 28 such labeling schemes worldwide (UNEP n.d.) are: 1) raising environmental awareness among main stakeholders such as industry, local authorities and consumers, 2) involving smaller enterprises in environmental activities, 3) improving the environmental performance in targeted areas, and 4) providing information for consumers.

Costa Rica's tourism authority, *Instituto Costarricense de Turismo*, introduced a certification scheme for sustainably operated hotels and lodges. After preparation starting in 1997, the Institute implemented the scheme by calling for hotels' participation. Despite initial enthusiasm with about 200 applications, this performance-based and third-party-monitored scheme has not necessarily realized its full potential due to a lack of institutional demand (Rivera 2004). Lodges in both case study sites were once certified by the Institute, but later dropped. Both owners shared the opinion that they did not find this certification worthwhile, when considering the transaction cost of maintaining the status. Another means to acknowledge sustainable operators is a travel guide titled *New Key to Costa Rica* (Blake and Becher 2002), in which the authors introduce operators that they label as sustainable tourism based on their own visits and evaluations. Both owners in the cases studied said to me they trusted the team of the New Key better, who started this evaluation earlier than the Institute and made occasional visits for updates. This implies limitations of any scheme, even a government-implemented one, which cannot provide enough motivation for owners to join. My inference is that such motivation varies depending on several factors, including: a visible rise in the number of incoming tourists, other economic benefits (e.g. tax exemption and payments for

environmental services), societal pressure (e.g. corporate social responsibility), and personal trust between those who certify and are certified.

Payments for environmental services

Payments for environmental services (PES) are an emerging instrument using mechanisms of direct payments as economic compensations for conservation practices. As described in Chapter 5, Costa Rica has implemented an innovative PES scheme called *Pagos por Servicios Ambientales* (PSA) since 1997 after the 1996 Forestry Law was passed. This system covers four types of environmental services: 1) carbon sequestration, 2) watershed protection, 3) biodiversity conservation, and 4) scenic beauty. I here discuss the role of PES for grassroots initiatives for forest conservation and community development.

There is no common definition of PES, although several characteristics are shared by various schemes around the world. It is basically a voluntary agreement between at least one provider (seller) and one buyer of a well defined service derived from the natural environment, under the condition that this service is securely and continuously provided; some schemes satisfy part but not all of these characteristics (Wunder 2007). In terms of the three categories (Salafsky and Wollenberg 2000) mentioned above, PES can be seen as an instrument linking livelihoods and conservation in the most direct way.

Ferraro (2001) also emphasizes the advantage of direct payments strengthening the linkages between individual well-being, individual action, and conservation performance. This motivates local efforts for conservation, changing the role of local residents from enemies to collaborators in pursuing conservation objectives; PES are a simple mechanism to help solve complex problems, and has clear advantages over agroforestry, ecotourism and other types of development interventions, according to Ferraro (2001).

PES have several key objectives. First and most importantly, they are a tool for promoting conservation of environmental services such as watershed protection and climate regulation. Second, at least some of the PES schemes aim to reduce poverty by improving the well-being of property holders with low cash incomes, particularly in rural areas. Third, extending the issues of poverty and conservation to an international or global scale, PES are regarded as a tool to mobilize finance widely and to bring opportunities for interested groups in conservation and development, as well as investors (Duraiappah 2006). The following clarifies the issues of PES in terms of the two objectives of forest conservation and community development, with fund mobilization considered in parallel.

In the case of CPPA in Talamanca, PSA were a significant source of income for the community association with the guaranteed revenue of approximately US$5,000 a year for protecting the 116-hectare forest. The amount was not as large as the project budget of US$20,000 provided by the Small Grant Program of the Global Environment Facility, for example. However, PSA had the advantage of being more secure and dependable than other income sources like tourism. Furthermore, the community association needed to spend less time and effort for receiving PSA than other activities such as housing tourists. The community association regarded PSA as a complementary incentive, but not as the primary determining factor for land use decisions.

In the individual property reserve in San Carlos, the income from PSA was insignificant when compared with the tourism revenue. The owner acknowledged the limited significance of PSA, describing PSA to be “better than nothing”. With a steady and well-paid profession elsewhere, PSA were only a marginal incentive to this owner, not a deciding factor for conservation.

In general, neither regulatory approaches nor incentive-based approaches alone function perfectly to achieve policy objectives. A better outcome results from a balanced combination of both,

like carrot and stick to make a horse keep running (Kitamura and Cao 2003). Costa Rica's PSA were found to be a carrot, working together with laws restricting forest conversion as a stick. All natural forests, including the two studied sites, are protected by the 1996 Forestry Law, but illegal clearance is still occurring due to imperfect enforcement (Morse and others 2009). A possible interpretation is that the government introduced the law as a stick, complemented by PSA as a carrot for forest owners complying with the law. And this carrot is actually eaten, not just shown to motivate a horse.

Further research is needed to evaluate whether PES can reduce poverty in reality. Several cases have been reported of positive impacts on the livelihoods of low-income forest owners (Munos 2004). Improvement in recipients' well-being is not an explicit objective of the PSA in Costa Rica, but the issue of poverty needs to be addressed anyway. This is because severe poverty might leave people with no choice but to use the land intensively. Many of the poorest people do not own land, and therefore are not eligible for PSA (Locatelli and others 2008). For PES to better serve the poor, several conditions have to be satisfied (Landell-Mills and Porras 2002). Among them, fundamental shifts in concepts and schemes, such as formalizing the property rights held by the poor, might require much care and time, but operational improvements could be carried out more easily, such as assistance enabling the poor population with land title to access the payment scheme.

Only those with clear property rights secured officially can become recipients of PES. Landless people are not eligible for PES, possibly enlarging the discrepancy between those with land titles and those without. Consequently, the introduction of PES may increase social differentiation and tension (Wunder 2005). The two cases in this research showed an increase in cash income without much extra investment of time or labor. The amount, however, was not necessarily high enough to be a deciding factor for conservation-based land use. In other words, the forest owners in both cases would be able to live without PES. And neither case was faced with squatting or encroachment by landless outsiders.

Whether a higher PES would secure more conservation needs to be answered with care. The claim that PES should be set at a higher amount than profits from other land use options such as logging and pasture (e.g. Ibarra 2007) is true. However, raising PES has a risk of weakening the relative importance of unique values held by individuals and communities. Both of the two cases studied in this research exemplified actions based on personal values, either individually or collectively, beyond a mere calculation of profitability. A higher income from PSA might change the meaning of forest conservation from a pursuit of personal values to a business opportunity, and thereby bring in participants who were less committed to maintaining a balance between conservation and development.

Another practical concern for forest owners is the transaction costs of PES. The individual owner of the forest reserve in San Carlos said that small areas of forest (e.g. <100 ha) would not be worth applying for PSA, considering the transaction costs of dealing with intermediary organizations and preparing paperwork. Where transaction costs with PES are large, the threshold area would be raised, narrowing the opportunities for forest owners. It is difficult for forest owners to estimate the transaction cost beforehand. On the other hand, administrative procedures would become easier from the second time. Intermediary organizations could also help reduce the transaction costs for applicants, as they did in both of the cases studied.

PES would be better regarded as an addition to, not a substitute for, existing income (Ferraro 2001). At the policy level, too, PES would better function when combined with other approaches such as top-down regulation in land use policy, rather than when regarded as an alternative

instrument in place of other approaches (Wunder 2006).The two cases in this research supported these arguments.

At the national and international level, Costa Rica's PSA added momentum to conservation policy by using a fuel tax for financing conservation, and inviting contributions from global donors. A wide range of PES schemes have been developed rapidly in recent years around the world, producing mixed results. There are several ways proposed for improving PES in general, such as clarifying the baseline for subsequent monitoring and evaluation, optimizing the payment channels, and aiming to strike a balance between efficiency and fairness (Wunder 2007).

Ibarra (2007) proposes that areas with high conservation values and facing pressure for land use change involving deforestation be prioritized. The rationale for such a proposal is that forest areas with topographical and other conditions not suitable for land development would be left intact, with or without PES. A more focused PES scheme would enhance the incentives for conservation in areas under pressure for land use change from logging, plantation agriculture or other high-intensity land uses. This research highlights the importance of human and social capital in undertaking conservation initiatives. The values and capacities of the owners, communal or individual, could be assessed with assistance from intermediary organizations when prioritizing target areas with PES.

Assessment of PES as a means of mobilizing funds requires clarification of who benefits and who bears the cost. Balmford and Whitten (2003) classify the benefits and costs of conservation and relative amounts borne respectively by local, national and global stakeholders. On the one hand, benefits comprise extraction of foods, lumber, medicine and other goods; nature-based tourism; localized services such as water regulation; dispersed services such as climate stabilization; and option, existence and bequest values. A remarkable trend in distribution of these benefits, according to Balmford and Whitten (2003), is that dispersed services and option, existence and bequest values benefit global stakeholders to a much greater extent than local and even national-level stakeholders.

On the other hand, costs are of two types: active and passive. Active costs generally mean the direct budget needed to implement conservation activities and enforce rules. Passive costs include opportunity costs and damage, for example by wild animals, derived from conservation. The implication is that local stakeholders, though bearing little active cost, incur much greater passive costs than national and global stakeholders; the global stakeholders, who receive the benefits of dispersed services but bear little passive cost, should provide more funds for conservation activities worldwide (Balmford and Whitten 2003).

Even at a watershed scale, it is difficult to establish a mechanism of distributing benefits and costs in a manner conceived as fair by most of the stakeholders (Postel and Thompson 2005). There are free riders who enjoy benefits without paying the costs. The PES are not a perfect mechanism for fund mobilization, but its implementation is a significant step providing momentum and practical lessons. Vatn (2010) argues that the commodification of environmental services can weaken social networks by replacing social contacts with market contacts. In contrast, Costa Rica's PSA program is attempting to involve more users of the environmental services as direct funding sources (Wunder and others 2008). If PES can contribute to a thickening of social networks and more direct contacts between participants, then PES may enhance the connections between the central and local governments and communities, and support grassroots conservation initiatives to a greater degree.

Tasks achieved, and future research needs

The findings from the cases studied in this research regarding the preconditions and promoting factors for enabling CPPAs and individual property reserves are summarized in Table 10. This list might not necessarily apply to all cases, as full generalization is beyond the scope of this research. The assessment here, however, suggests further research into grassroots institutions for conservation.

Table 10: Preconditions and promoting factors for CPPAs and individual property reserves

Criteria		Conditions	CPPA	Individual property reserve
Physical Characteristics				
	Boundaries	Clearly defined spatial boundaries	Yes.	Yes.
	Area (spatial size) and connectivity	Small size for each unit, but connected to larger conservation areas	Yes.	Yes.
Social capacity				
	Community	Proximity to the area; absence of severe poverty; low level of dependence on extractive resource use in the area; shared norms; high social capital and capacity (leadership, knowledge, skills, mutual trust among members, institutional base, etc.)	Yes (but medium proximity).	N/A
	Goals and targets	Conservation *and* well-being of local people clearly identified as dual goals; explicit priorities established (key species to protect, activities to implement, etc.)	Yes.	Yes.
	Decision making	Participatory and adaptive processes of making decisions	Yes.	N/A (basically individual decisions).
Property rights and stakeholder relationships		Multi-layered structure (local community in the core; state, academic and NGOs in the periphery) with varying bundles of rights	Yes.	N/A (but similar structure observed).
Driving forces		Economic incentives and mental values to initiate and maintain the practice	Yes (mainly personal values and tourism).	Yes (mainly personal values and tourism).

The main purpose of this research was to connect the theory of common property with the policy of protected areas. The case studies found that common property, as well as individual property, could enhance conservation and local people's well-being, if several conditions are fulfilled as outlined above. The scope of the empirical research is not extensive, limiting the applicability of the findings to general theory. Nevertheless, this research expects to contribute to

advancement of our understanding and exploration into issues surrounding grassroots initiatives aimed at conservation and development.

Ibarra (2007, 11) describes two requirements for grassroots initiatives for conservation: “Unless altruistic motives prevail over income maximization, and/or income is assured from other sources, voluntary forest protection seems an unlikely decision.” The case studies in this research found this claim to be reasonable. Stewardship, supported by personal and social values, was certainly found to be important in emergence and sustenance of grassroots initiatives for conservation and development. Attachment to land, not just any land but the particular place, lifestyles and a sense of values unique to the area can be strong defenses against any external interests that could potentially bring about deterioration of the environment in the sites. Such locally unique values and norms cannot be easily studied or expressed. Understanding these values is a difficult task, particularly for outsiders.

A next task is to return to the field, particularly the two sites studied in detail. It is my hope to follow up the case studies as part of a longitudinal study of grassroots institutions and community protected areas over a decade. Lessons learned from this research would be useful in the future research in other sites as well. Where a longer term commitment is possible, the researcher’s role could be extended from an observer to a collaborator, using participatory action research where feasible and appropriate.

There are further possibilities for combining innovations in common property with protected area networks. Canada’s park policy, for example, may be extended more widely in areas not owned by the government. When all the property holders within a region agree on goals of conservation and local development, it is possible to establish institutions and procedures for making important land-use decisions collaboratively. In this way, the region can become a corridor with quasi-common property. Transboundary parks across multiple nations might also be established more widely around the world, using the concept of common property protected areas in order to share the goal and identify the rights and roles of stakeholder groups.

Appendices

Appendix 1: Interview guide

To community members

- When was the reserve established?
- What are the rules of the reserve?
- What are the benefits and costs (including negative impacts) derived from the reserve?
- How are these benefits and costs distributed among the community members (and other stakeholders if at all)?
- How long have you lived in the area?
- How long have you been involved in the management of the reserve?
- How are the decisions made regarding the use of the reserve?
- To what extent do you think your opinions and interests are represented in decisions and the process making them?
- How do you find the current state of the natural environment (air, water, soil, vegetation, biodiversity, etc.) in the area, compared to that before the establishment of the reserve?
- To what extent does the use as a reserve contribute to this change?
- How is your current level of well-being, compared to other members of the community?
- How is your current level of well-being, compared to that before the reserve was established?
- To what extent does the reserve contribute to the change in your well-being over time?
- How much of all the benefit comes from tourism?
- How is tourism planned, operated and advertised?
- How much of the revenue remains in the community?
- What kinds of support, if any, do you receive from outside organizations such as the government, NGOs, tourism networks, academics, etc?

To government officials

- How are non-public protected areas recognized in policy?
- What is considered to be the advantage of non-public protected areas (including collectively managed areas) for conservation and development policies in Costa Rica?
- What is considered to be the disadvantage of non-public protected areas (including collectively managed areas) for conservation and development policies in Costa Rica

To scientists and NGO staff

- What is the status of collectively managed private reserves in Costa Rica?
- What makes the basis of grass roots conservation initiatives in Costa Rica?
- What is your role?

Appendix 2: Interview schedule

#	Affiliation	Main topic	yymmdd	Venue
1	Owner of the reserve/lodge, San Carlos	Management of the reserve	040116 +	San Jose & San Carlos
2	General Manager of the lodge, San Carlos	Management of the reserve	040116 +	San Jose & San Carlos
3	Staff of lodge, San Carlos	Community issues	040216	In front of her house
4	Owner of nearby reserve/lodge, San Carlos	His new lodge and reserve	040218	His lodge
5	Local resident and committee executive	Community issues	040220	Her house
6	Local high school teacher	Community issues	040220	High school
7	President of local association	Community issues	040220	His house
8	Local school teacher	Community issues	040220	School
9	Local resident and store owner	Community issues	040220	Her house
10	NGO (Commission of Forest Development of San Carlos)	Payment for environmental services	040222	Lodge in San Carlos
11 12	NGO (Tropical Science Center)	San Juan-La Selva Biological Corridor & Proposed Maquenque National Park	040227 040714	Office, San Jose
13	NGO (Tropical Science Center)	Small Reserve Network	040301	Office, San Jose
14	President of community association, Talamanca	Management of the reserve	040302 +	His house
15	Government (National Forest Finance Fund)	Payments for environment services	040331	Office, San Jose
16	NGO (ANAI)	Talamanca case	040401	Office, San Jose
17	Professor, University for Peace	Non-public conservation in Costa Rica	040405	Campus
18	Professor, University for Peace	Non-public conservation in Costa Rica	040405	Campus
19	Instructor (EARTH; Presidente, Red Costarricense de Reservas Privadas)	Private Reserve Network	040701	Campus
20	Government (National Biodiversity Institute)	Bioprospecting in private reserves; the Institute's reserve	040709	Office, Heredia
21	NGO (CEDARENA)	CEDARENA's conservation easements program	040714	Office, San Jose
22	Proyecto Araucaria; JICA	Their watershed management project	040720	Project office, San Jose
23	Government (National System of Conservation Areas)	The System and its relationship with private reserves	040722	Office, San Jose
24	Community association (ASEPALECO)	ASEPALECO	040727	Office, ASEPALECO
25	Caretaker/guide, ASEPALECO	Management of the reserve	040727	Lodge, ASEPALECO
26	Researcher, Universidad of Costa Rica	Payments for environmental services	040804	Campus, UCR
27	Professor, National University	Payments for environmental services	040805	Campus, Heredia

+) Contacted more than once

Reference List

Abbot, J. 1999. Beyond Tools and Methods: Reviewing Developments in Participatory Learning and Action. *Environment and Urbanization* 11(1): 231-234.

Agrawal, A. 1994. Rules, Rule Making, and Rule Breaking: Examining the Fit between Rule Systems and Resource Use. In *Rules, Games, and Common-Pool Resources*, by E. Ostrom, R. Gardner, and J. Walker, 267-282. Ann Arbor: University of Michigan Press.

Agrawal, A. 2002. Common Resources and Institutional Sustainability. In *The Drama of the Commons*, edited by E. Ostrom, T. Dietz, N. Dolsak, P.C. Stern, S. Stonich, and E.U. Weber, 41-85. Washington, D.C.: National Academy Press.

Agrawal, A, and C.C. Gibson. 1999. Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation. *World Development* 27(4): 629-649.

Agrawal, A, and E. Ostrom. 1999. Collective Action, Property Rights, and Devolution of Forest and Protected Area management. In *Collective Action, Property Rights and Devolution of Natural Resource Management – Exchange of Knowledge and Implications for Policy*. Proceedings of the International Conference, June 21-25, Puerto Azul, The Philippines, edited by R Meinzen-Dick, A. Knox, and M. Di Gregorio, 75-109.

Agrawal, A., and E. Ostrom. 2001. Collective Action, Property Rights, and Decentralization in Resource Use in India and Nepal. *Politics and Society* 29(4): 485-514.

Aguilar, B.J. 1999. Application of Ecosystem Health for the Sustainability of Managed Systems in Costa Rica. *Ecosystem Health* 5(1): 36-48.

Akimichi, T. 1999. Shizen wa dare no monoka [Who owns nature?]. In *Shizen wa dare no monoka* [Who owns nature?], edited by T. Akimichi, 4-20. Kyoto: Showado [in Japanese].

Akimichi, T. 2004. *Komonzu no jinruigaku: bunka, rekishi, seitai* [Anthropology of the commons: culture, history and ecology]. Kyoto: Jinbun Shoin [in Japanese].

Allen, R. 1980. *How to Save the World: Strategy for World Conservation*. London: Kogan Page.

Anger, D. 1989. 'No Queremos el Refugio': Conservation and Community in Costa Rica. *Alternatives* 16(3): 18-22.

Aref F., M. Redzuan, S.S. Gill, and A. Aref. 2010. Assessing the Level of Community Capacity Building in Tourism Development in Local Communities. *Journal of Sustainable Development* 3(1): 81-90.

Asociacion ANAI. n.d. Asociacion ANAI. [http://anaicr.org/].

ATEC. 1993. *Coastal Talamanca: A Cultural and Ecological Guide*. Puerto Viejo, Talamanca, Costa Rica: Talamanca Association for Ecotourism and Conservation.

Baez, A.L. 1996. Learning from Experience in the Monteverde Cloud Forest, Costa Rica. In *People and Tourism in Fragile Environments*, edited by M.F. Price, 109-122.Chichester: Wiley.

Balmford, A., and T. Whitten. 2003. Who Should Pay for Tropical Conservation, and How Could the Costs Be Met? *Oryx* 37(2): 238-250.

Bardach, E. 2000. *A Practical Guide for Policy Analysis: The Eightfold Path to More Effective Problem Solving*. New York: Chatham House Publishers of Seven Bridges Press.

Bebbington, A. 2000. Reencountering Development: Livelihood Transitions and Place Transformations in the Andes. *Annals of the Association of American Geographers* 90(3): 495-520.

Bengston, D.N. 1994. Changing Forest Values and Ecosystem Management. *Society and Natural Resources* 7(6): 515-533.

Berkes, F., ed. 1989. *Common Property Resources: Ecology and Community-Based Sustainable Development*. London: Belhaven Press.

Berkes, F., D. Feeny, B.J. McCay, and J. M. Acheson. 1989. The Benefits of the Commons. *Nature* 340: 91-93.

Bernbom, G. 2000. *Analyzing the Internet as a Common Pool Resource: The Problem of Network Congestion*. Paper presented at Constituting the Commons: Crafting Sustainable Commons in the New Millennium, the Eighth Conference of the International Association for the Study of Common Property, Bloomington, Indiana, USA, May 31 – June 4.

Berntzen, E. 1993. Democratic Consolidation in Central America: A Qualitative Comparative Approach. *Third World Quarterly* 14(3): 589-604.

Blackstock, K. 2005. A Critical Look at Community Based Tourism. *Community Development Journal* 40(1): 39-49.

Blaikie, N. 2000. *Designing Social Research: The Logic of Anticipation*. Cambridge, UK: Policy Press.

Blake, B., and A. Becher. 2002. *The New Key to Costa Rica*. Sixteenth Edition. Berkeley, CA: Ulysses Press.

Blomley, N. 2004a. The Boundaries of Property: Lessons from Beatrix Potter. *Canadian Geographer* 48(2): 91-100.

Blomley, N. 2004b. *Unsettling the City: Urban Land and the Politics of Property*. New York; London: Routledge.

Borrini-Feyerabend, G., A. Kothari, and G. Oviedo. 2004. *Indigenous and Local Communities and Protected Areas: Towards Equity and Enhanced Conservation*. Gland, Switzerland and Cambridge, UK: IUCN

Boza, M.A. 1993. Conservation in Action: Past, Present, and Future of the National Park System of Costa Rica. *Conservation Biology* 7(2): 239-247.

Boza, M.A., D. Jukofsky, and C. Wille. 1995. Costa Rica Is a Laboratory, Not Ecotopia. *Conservation Biology* 9(3): 684-685.

Bradshaw, B. 2003. Questioning the Credibility and Capacity of Community-Based Resource Management. *Canadian Geographer* 47(2): 137-150.

Brandon, K., L.J. Gorenflo, A.S.L. Rodrigues, and R.W. Waller. 2005. Reconciling Biodiversity Conservation, People, Protected Areas, and Agricultural Suitability in Mexico. *World Development* 33(9): 1403-1418.

Brechin, S.R., P.R. Wilshusen, C.L. Fortwangler, and P.C. West. 2002. Beyond the Square Wheel: Toward a More Comprehensive Understanding of Biodiversity Conservation as Social and Political Process. *Society and Natural Resources* 15: 41-64.

Brockett, C.D., and R.R. Gottfried. 2002. State Policies and the Preservation of Forest Cover: Lessons from Contrasting Public-Policy Regimes in Costa Rica. *Latin American Research Review* 37(1): 7-40.

Brohman, J. 1996. New Directions in Tourism for Third World Development. *Annals of Tourism Research* 23(1): 48-70.

Bromley, D.W. 1992. The Commons, Common Property, and Environmental Policy. *Environmental and Resource Economics* 2: 1-17.

Bromley, D.W. 2003. Let's Focus on the Performance of Alternative Institutional Arrangements. *Common Property Resource Digest* 67: 4-5.

Bromley, D.W., and M.M. Cernea. 1989. *The Management of Common Property Natural Resources: Some Conceptual and Operational Fallacies*. Discussion Paper 57. Washington, D.C.: World Bank.

Bromley, D.W., D. Feeny, M.A. McKean, P. Peters, J.L. Gilles, R.J. Oakerson, C.F. Runge, and J.T. Thompson, eds. 1992. *Making the Commons Work: Theory, Practice, and the Policy*. San Francisco: ICS Press.

Brooks, T.M., G.A.B. da Fonseca, and A.S.L. Rodrigues. 2004. Protected Areas and Species. *Conservation Biology* 18(3): 616-618.

Brown, T.C. 1984. The Concept of Value in Resource Allocation. *Land Economics* 60(3): 231-246.

Brown, J., and B. Mitchell. 1997. Extending the Reach of National Parks and Protected Areas: Local Stewardship Initiatives. In *National Parks and Protected Areas: Keystones to*

Conservation and Sustainable Development, edited by J.G. Nelson, and R. Serafin, 103-116. Berlin; New York: Springer.

Bruner, A.G., R.E. Gullison, R.E. Rice, and G.A.B. da Fonseca. 2001. Effectiveness of Parks in Protecting Tropical Biodiversity. *Science* 291: 125-128.

Brydon-Miller, M., D. Greenwood, and P. Maguire. 2003. Why Action Research? *Action Research* 1(1): 9-28.

Bücking, W. 2003. Are there threshold numbers for protected forests? *Journal of Environmental Management* 67(1): 37-45.

Budowski, G. 1976. Tourism and Environmental Conservation: Conflict, Coexistence, or Symbiosis? *Environmental Conservation* 3(1): 27-31.

Butler, R.W. 1980. The Concept of a Tourist Area Cycle of Evolution: Implications for Management of Resources. *Canadian Geographer* 24: 5-12.

Cameron, R.P. 2006. Protected Area - Working Forest Interface: Ecological Concerns for Protected Areas Management in Canada. *Natural Areas Journal* 26(4): 403-407.

Campbell, L.M. 1999. Ecotourism in Rural Developing Communities. *Annals of Tourism Research* 26(3): 534-553.

Campbell, L.M. 2002. Conservation Narratives in Costa Rica: Conflicts and Co-existence. *Development and Change* 33: 29-56.

Campbell, L.M., and A. Vainio-Mattila. 2003. Participatory Development and Community-based Conservation: Opportunities Missed for Lessons Learned? *Human Ecology* 31(3): 417-438.

Castellanet, C., and C.F. Jordan. 2002. *Participatory Action Research in Natural Resource Management: A Critique of the Method Based on Five Years' Experience in the Transamazonica Region of Brazil*. New York: Taylor & Francis.

Castro, R., F. Tattenbach, L. Gamez, and N. Olson. 2000. The Costa Rican Experience with Market Instruments to Mitigate Climate Change and Conserve Biodiversity. *Environmental Monitoring and Assessment* 61: 75-92.

Ceballos-Lascurain, H. 1994. *Tourism, Ecotourism, and Protected Areas: The State of Nature-Based Tourism around the World and Guidelines for Its Development*. Gland, Switzerland: IUCN.

CEDARENA. n.d. Centro de Derecho Ambiental y de los Recursos Naturales. [http://www.cedarena.org/].

Central Intelligence Agency. n.d. *The World Factbook: Costa Rica*. [https://www.cia.gov/library/publications/the-world-factbook/].

Chai, S-L., E. Tanner, K. McLaren. 2009. High Rates of Forest Clearance and Fragmentation pre- and post-National Park Establishment: The Case of a Jamaican Montane Rainforest. *Biological Conservation* 142: 2484-2492.

Chambers, R. 1994a. The Origins and Practice of Participatory Rural Appraisal. *World Development* 22(7): 953-969.

Chambers, R. 1994b. Participatory Rural Appraisal (PRA): Analysis of Experience. *World Development* 22(9): 1253-1268.

Chambers, R. 1994c. Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm. *World Development* 22(10): 1437-1454.

Chambers, R. 2002. *Participatory Workshop: A Sourcebook of 21 Sets of Ideas and Activities*. London; Sterling, VA: Earthscan.

Chape, S., S. Blyth, L. Fish, P. Fox, and M. Spalding (compilers). 2003. *2003 United Nations List of Protected Areas*. Gland, Switzerland and Cambridge, UK: IUCN; Cambridge, UK: UNEP-WCMC.

Chape, S., J. Harrison, M. Spalding, and I. Lysenko. 2005. Measuring the Extent and Effectiveness of Protected Areas as an Indicator for Meeting Global Biodiversity Targets. *Philosophical Transactions of the Royal Society B* 360: 443-455.

Chapin, M. 2004. A Challenge to Conservationists. *World Watch* 17(6): 17-31

Chassot, O., G. Monge, and G. Powell. 2006. Conservation Biology of the Great Green Macaw (1994-2006), 12 Years of Experience. San Pedro, Costa Rica: Tropical Science Center.

Chomitz, K.M., E. Brenes, and L. Constantino. 1999. Financing Environmental Services: The Costa Rican Experience and Its Implications. *Science of the Total Environment* 240: 157-169.

Chuenpagdee, R., J. Fraga, and J.I. Euan-Avila. 2004. Progressing toward Comanagement through Participatory Research. *Society and Natural Resources* 17: 147-161.

Ciriacy-Wantrup, S.V., and R.C. Bishop. 1975. "Common Property" as a Concept in Natural Resource Policy. *Natural Resources Journal* 15(4): 713-727.

Clapp, R.A. 2004. Wilderness Ethics and Political Ecology: Remapping the Great Bear Rainforest. *Political Geography* 23: 839–862.

Coad, L., N.D. Burgess, B. Bomhard, and C. Besancon. 2009. *Progress on the Convention on Biological Diversity's 2010 and 2012 Targets for Protected Area Coverage*. A technical report for the IUCN international workshop "Looking to the Future of the CBD Programme of Work on Protected Areas", Jeju Island, Republic of Korea, 14-17 September 2009. Cambridge, UK: UNEP-WCMC.

Colchester, M. 1996. Beyond 'Participation': Indigenous Peoples, Biological Diversity Conservation and Protected Area Management. *Unasylva* 47(3): 33-39.

Conley, A., and M.A. Moote. 2003. Evaluating Collaborative Natural Resource Management. *Society and Natural Resources* 16: 371-386.

Critical Ecosystem Partnership Fund. 2005. *New Wildlife Refuge a "Laboratory for Sustainable Development"*. [http://www.cepf.net/news/top_stories/Pages/jul202005_wldfrefuge_laboratory.aspx].

Crofts, R. 2004. Linking Protected Areas to the Wider World: A Review of Approaches. *Journal of Environmental Policy and Planning* 6(2): 143-156.

Cronon, W. 1995. The Trouble with Wilderness; Or, Getting Back to the Wrong Nature. In *Uncommon Ground: Toward Reinventing Nature*, edited by W. Cronon, 69-90. New York: W.W. Norton & Co.

Crook, C. 2001. *Biodiversity Prospecting Agreements: Evaluating Their Economic and Conservation Benefits in Costa Rica and Peru*. Ph.D. Thesis, Department of Geography, University of Toronto.

Crook, C., and R.A. Clapp. 1998. Is Market-Oriented Forest Conservation a Contradiction in Terms? *Environmental Conservation* 25(2): 131-145.

Daily. G., and P. Ehrlich. 1992. Population, Sustainability, and the Earth's Carrying Capacity. *Bioscience* 42(10): 761-771.

Daily, G.C., and K. Ellison. 2002. *The New Economy of Nature: The Quest to Make Conservation Profitable*. Washington, D.C.: Island Press.

Daniel, T.C. 1988. Human Values and Natural Systems: A Psychologist's Response. *Society and Natural Resources* 1: 285-290.

de Camino, R., O. Segura, L.G. Arias, and I. Perez. 2000. *Costa Rica: Forest Strategy and the Evolution of Land Use*. Evaluation Country Case Study Series. Washington: World Bank.

De Lacy, T., and B. Lawson. 1997. The Uluru/Kakadu Model: Joint Management of Aboriginal-Owned National Parks in Australia. In *Conservation through Cultural Survival: Indigenous Peoples and Protected Areas*, edited by S. Stevens, 155-187. Washington, DC: Island Press.

Dearden, P. 1995. Park Literacy and Conservation. *Conservation Biology* 9: 1654-1656.

Dearden, P. 2002. "Dern Sai Klang": Walking the Middle Path to Conservation in Thailand. In *Environmental Protection and Rural Development in Thailand*, edited by P. Dearden, 377-400. Bangkok: White Lotus Press.

Dearden, P., and R. Rollins. 2002. The Times They Are Still A-Changin'. In *Parks and Protected Areas in Canada: Planning and Management*, edited by P. Dearden, and R. Rollins, 3-20. Second Edition. Toronto: Oxford University Press.

Deguise, I.E., and J.T. Kerr. 2006. Protected Areas and Prospects for Endangered Species Conservation in Canada. *Conservation Biology* 20(1): 48-55.

Dempsey, J., P. Dearden, and J.G. Nelson. 2002. Stewardship: Expanding Ecosystem Protection. In *Parks and Protected Areas in Canada: Planning and Management*, edited by P. Dearden, and R. Rollins, 379-399. Second Edition. Toronto: Oxford University Press.

Dharmaratne, G.S., F. Yee Sang, and L.J. Walling. 2000. Tourism Potentials for Financing Protected Areas. *Annals of Tourism Research* 27(3): 590-610.

Diamond, J.M. 1975. The Island Dilemma: Lessons of Modern Biogeographic Studies for the Design of Nature Reserves, *Biological Conservation* 7: 129–146

Dickinson, J.C. 1999. Forest Management Certification as a Tool for Conservation. *Geographical Review* 89(3): 431-439.

Dietz, T., N. Dolsak, E. Ostrom, and P.C. Stern. 2002. The Drama of the Commons. In *The Drama of the Commons*, edited by E. Ostrom, T. Dietz, N. Dolsak, P.C. Stern, S. Stonich, and E.U. Weber, 3-35. Washington, D.C.: National Academy Press.

Dietz, T., E. Ostrom, and .P.C. Stern. 2003. The Struggle to Govern the Commons. *Science* 302: 1907-1912.

Dion, M. 2000. The Moral Status of Non-human Beings and Their Ecosystems. *Ethics, Place and Environment* 3(2): 221-229.

Dolsak, N., and E. Ostrom. 2003. The Challenges of the Commons. In *The Commons in the New Millennium: Challenges and Adaptation*, edited by N. Dolsak, and E. Ostrom, 3-34. Cambridge, MA: MIT Press.

Donohoe, H.M., and R.D. Needham. 2006. Ecotourism: The Evolving Contemporary Definition. *Journal of Ecotourism* 5(3): 192-210.

Donovan, R.Z. 2000. *Observations on Equity After Ten Years of SmartWood Certification*. [http://www.rainforest-alliance.org/forestry/documents/observations.pdf].

Dudley, N. ed. 2008. *Guidelines for Applying Protected Area Management Categories*. Gland, Switzerland: IUCN.

Dudley, N. 2009. Why is Biodiversity Conservation Important in Protected Landscapes? *George Wright Forum* 26(2): 31-38.

Dudley, N., B. Gujja, B. Jackson, J. Jeanrenaud, G. Oviedo, A. Phillips, P. Rosabel, S. Stolton, and S. Wells. 1999. Challenges for Protected Areas in the 21st Century. In *Partnerships for Protection: New Strategies for Planning and Management for Protected Areas*, edited by S. Stolton, and N. Dudley, 3-12. London: Earthscan.

Duraiappah, A.K. 2006. *Markets for Ecosystem Services: A Potential Tool for Multilateral Environmental Agreements*. Winnipeg: International Institute for Sustainable Development.

Eagles, P.F.J. 2009. Governance of Recreation and Tourism Partnerships in Parks and Protected Areas. *Journal of Sustainable Tourism* 17(2): 231-248.

Eagles, P.F.J., McCool, S.F., and Haynes, C.D.A. 2002. *Sustainable Tourism in Protected Areas: Guidelines for Planning and Management*. Gland, Switzerland and Cambridge, UK: IUCN.

Ecotrust Canada and Ecotrust. 1997. *More Than the Sum of Our Parks: People, Places and a Protected Areas System for British Columbia*.

ELI [Environmental Law Institute]. 2003. *Legal Tools and Incentives for Private Lands Conservation in Latin America: Building Models for Success*. Washington, DC: Environmental Law Institute.

Escobar, A. 1996. Construction Nature: Elements for a Post-structuralist Political Ecology. *Futures* 28(4): 325-343.

Evaluation Group for Rational Utilization of Forest Land Trial and Pilot Project in Yunnan Province. 1998. *Evaluation Report on Rational Utilization of Forest Land Trial and Pilot Project in Yunnan Province*.

Evans, K., W. de Jong, P. Cronkleton, D. Sheil, T. Lynam, T. Kusumanto, and C.J. Pierce Colfer. 2006a. *Guide to Participatory Tools for Forest Communities*. Jakarta: Center for International Forestry Research.

Evans, K., S.J. Velarde, R. Prieto, S.N. Rao, S. Sertzen, K. Davila, P. Cronkleton, and W. de Jong. 2006b. *Field Guide to the Future: Four Ways for Communities to Think Ahead*.Center for International Forestry Research; ASB; World Agroforestry Centre.

Evans, S. 1999. *The Green Republic: A Conservation History of Costa Rica*. Austin, TX: University of Texas Press.

Ewel, J.J. 1999. Natural Systems as Models for the Design of Sustainable Systems of Land Use. *Agroforestry Systems* 45: 1-21.

FAO. 1987. *Incentives for Community Involvement in Conservation Programmes*. Rome: Food and Agriculture Organization of the United Nations.

Feeny, D., F. Berkes, B.J. McCay, and J.M. Acheson. 1990. The Tragedy of the Commons: Twenty-Two Years Later. *Human Ecology* 18: 1-19.

Ferraro, P. 2001. Global Habitat Protection: Limitations of Development Interventions and a Role for Conservation Performance Payments. *Conservation Biology* 15(4): 990-1000.

Figgis, P. 1993. Foreword. In *Ecotourism and Nature-Based Holidays*, by J. Richardson, and the Editors of Choice Books, v-vii. Marrickville, NSW, Australia: Simon and Schuster.

Fitzsimons, J.A., and G. Wescott. 2004. The Classification of Lands Managed for Conservation: Existing and Proposed Frameworks, with Particular Reference to Australia. *Environmental Science and Policy* 7: 477-486.

Fitzsimons, J.A., and G. Wescott. 2005. History and Attributes of Selected Australian Multi-tenure Reserve Networks. *Australian Geographer* 36(1): 75-93.

Fletcher, R. 2010. Ecotourism Discourse: Challenging the Stakeholder Theory. *Journal of Ecotourism* 8(3): 269-285.

Fukuoka, K. 2000. Kankyo seisaku no senryakuteki shuho no tenkai [Application of strategic measures in environmental policy]. *Earthian* March: 2-3 [in Japanese].

Garcia, R. 2002. *Biologia de La Conservacion: Conceptos y Practicas*. Santo Domingo de Heredia, Costa Rica: INBio.

Garcia-Frapolli, E., G. Ramos-Fernandez, E. Galicia, and A. Serrano. 2009. The Complex Reality of Biodiversity Conservation through Natural Protected Area Policy: Three Cases from the Yucatan Peninsula, Mexico. *Land Use Policy* 26: 715-722.

Garnett, S.T., J. Sayer, and J. du Toit. 2007. Improving the Effectiveness of Interventions to Balance Conservation and Development: A Conceptual Framework. *Ecology and Society* 12(1): 2.

Gaston, K.J., S.F. Jackson, L.Cantu-Salazar, and G. Cruz-Pinon. 2008. The Ecological Performance of Protected Areas. *Annual Review of Ecology, Evolution, and Systematics* 39: 93-113.

Geertz, C. 1973. *The Interpretation of Cultures*. New York: Basic Books.

Gill, A. 1996. Rooms with a View: Informal Settings for Public Dialogue. *Society and Natural Resources* 9: 633-643.

Gill, A. 2000. From Growth Machine to Growth Management: The Dynamics of Resort Development in Whistler, British Columbia. *Environmental and Planning A* 32: 1083-1103.

Gilpin, M.E., and J.M. Diamond. 1980. Subdivision of Nature Reserves and the Maintenance of Species Diversity. *Nature* 285: 567 – 568.

Giordano, M. 2003. The Geography of the Commons: The Role of Scale and Space. *Annals of the Association of American Geographers* 93(2): 365-375.

Gordon, H.S. 1954. The Economic Theory of a Common-Property Resource: The Fishery. *Journal of Political Economy* 62(2): 124-142.

Grafton, R.Q. 2000. Governance of the Commons: A Role for the State? *Land Economics* 76(4): 504-517.

Grandstaff, T.B., and D.A. Messerschmidt. 1995. *A Manager's Guide to the Use of Rapid Rural Appraisal*. Bangkok: FAO/UNDP and Suranaree University of Technology.

Green, M.J.B., and J. Paine. 1999. State of the World's Protected Areas at the End of the 20th Century. In *Partnerships for Protection: New Strategies for Planning and Management for Protected Areas*, edited by S. Stolton, and N. Dudley, 18-28. London: Earthscan.

Groeneveld, R. 2004. Economic Considerations in the Optimal Size and Number of Reserve Sites. *Ecological Economics* 52(2); 219-228.

GTZ. 1998. *Tourism, Conservation and Farmers: Possibilities and Limitations of Ecosystem Promotion in Livelihood Systems*. Eschborn, Germany: Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ) GmbH.

Hardin, G. 1968. The Tragedy of the Commons. *Science* 162: 1243-1248.

Hardin, G. 1974. Living on a Lifeboat. *BioScience* 24(October): 561-568.

Hardin, G. 1998. Extensions of "The Tragedy of the Commons". *Science* 280: 682-683.

Harrison, J. 2002. International Agreements and Programmes on Protected Areas. *Parks* 12(3): 2-6.

Hasegawa, K. 2006. For Flying and Creeping Environmental Sociologists: Fighting at the ISA's World Congress of Sociology. *Journal of Environmental Sociology* 12:165-177 [in Japanese with English abstract].

Hassan, R., R. Scholes, and N. Ash, eds. 2005. *Ecosystems and Human Well-being: Current State and Trends: Findings of the Condition and Trends Working Group*. Washington, DC: Island Press.

Hawkins, D.E. 1994. Ecotourism: Opportunities for Developing Countries. In *Global Tourism: The Next Decade*, edited by W.F. Theobald, 261-273. Oxford: Butterworth-Heinemann.

Hayes, T.M., 2006. Parks, People, and Forest Protection: An Institutional Assessment of the Effectiveness of Protected Areas. *World Development* 34(12): 2064-2075.

Hazen, H.D., and L.M. Harris. 2007. Limits of Territorially-Focused Conservation: A Critical Assessment Based on Cartographic and Geographic Approaches. *Environmental Conservation* 34(4): 280-290.

Head, L. 2000. *Cultural Landscapes and Environmental Change*. London: Arnold.

Henneberger, J.W. 1998. On the Origin of Protected Areas. In *Linking Protected Areas with Working Landscapes Conserving Biodiversity*: Proceedings of the Third International Conference on Science and Management of Protected Areas, 12-16 May 1997, edited by Munro, N.W., and J.H.M. Willison, 833-840. Wolfville, N.S.: Science and Management of Protected Areas Association.

Herath, G. 2002. The Economics and Politics of Wilderness Conservation in Australia. *Society and Natural Resources* 15 (2): 147-159.

Herbert, S. 2000. For Ethnography. *Progress in Human Geography* 24(4): 550-568.

Hess, C. 2003. Why the IASCP Mission Statement Should Be Changed. *Common Property Resource Digest* 67: 1-3.

Hess, C., and R. Meinzen-Dick. 2006. The Name Change; or, What Happened to the "P"?. *Commons Digest* 2: 1-4.

Hess, K. 2001. Parks Are for People – But Which People? In *The Politics and Economics of Park Management*, edited by T.L. Anderson, and A. James,159-181. Lanham: Rowman & Littlefield.

Hetherington, J., T.C. Daniel, and T.C. Brown. 1994. Anything Goes Means Evertyhing Stays: The Perils of Uncritical Pluralism in the Study of Ecosystem Values. *Society and Natural Resources* 7(6): 535-546.

Higgs, A.J., and M.B. Usher. 1980. Should Nature Reserves Be Big or Small? *Nature* 285: 568–569.

Himes, A.H. 2007. Performance Indicators in MPA Management: Using Questionnaires to Analyze Stakeholder Preferences. *Ocean & Coastal Management* 50: 329-351.

Hockings, M. 1998. Evaluating Management of Protected Areas: Integrating Planning and Evaluation. *Environmental Management* 22(3): 337-345.

Hockings, M., S. Stolton, and N. Dudley. 2000. *Evaluating Effectiveness: A Framework for Assessing the Management of Protected Areas*. Gland, Switzerland; Cambridge, UK: IUCN.

Hockings, M., S. Stolton, F. Leverington, N. Dudley, and J. Courrau. 2006. *Evaluating Effectiveness: A Framework for Assessing Management Effectiveness of Protected Areas*. 2nd edition. Gland, Switzerland; Cambridge, UK: IUCN.

Holdridge, L.R. 1947. Determination of World Plant Formations from Simple Climatic Data. *Science* 105 (No. 2727): 367-368.

Holdridge, L.R. 1967. *Life Zone Ecology*. San Jose, Costa Rica: Tropical Science Center.

Holling, C.S. 2000. Theories for Sustainable Futures. *Conservation Ecology* 4(2): 7.

Holman, J. 2000. *Electronic Information as a Commons: The Issue of Access*. Paper presented at "Constituting the Commons: Crafting Sustainable Commons in the New Millennium", the Eighth Conference of the International Association for the Study of Common Property, Bloomington, Indiana, USA, May 31 – June 4, 2000.

Honey, M. 1999. *Ecotourism and Sustainable Development: Who Owns Paradise?* Washington, D.C.: Island Press.

Houck, O.A. 1997. On the Law of Biodiversity and Ecosystem Management. *Minnesota Law Review* 81(4): 869-979.

Hunt, L., and W. Haider. 2001. Fair and Effective Decision Making in Forest Management Planning. *Society and Natural Resources* 14: 873-887.

Hunter, J.R. 1994. Is Costa Rica Truly Conservation-Minded? *Conservation Biology* 8(2): 592-595.

Hyndman, J. 2001. The Field as Here and Now, Not There and Then. *Geographical Review* 91(1-2): 262-272.

Ibarra, E. 2007. The Profitability of Forest Protection versus Logging and the Role of Payments for Environmental Services (PES) in the Reserva Forestal Golfo Dulce, Costa Rica. *Forest Policy and Economics* 10: 7-13.

ICT. n.d. Instituto Costarricense de Turismo. [http://www.visitcostarica.com/ict/].

IISD (International Institute for Sustainable Development). 2003. A Summary Report of the Vth IUCN World Parks Congress. *Sustainable Developments* 89(9): 1-16.

IMN, MINAE, and UNEP. 1996. *Propuesta Tecnica de Ordenamiento Territorial con Fines de Conservacion de Biodiversidad: Proyecto GRUAS*. Ministerio del Ambiente y Energia.

INBio. n.d. Instituto Nacional de Biodiversidad. [http://www.inbio.ac.cr].

INEC. n.d. Instituto Nacional de Estadistica y Censos, Costa Rica. [http://www.inec.go.cr/].

Inoue, M. 2001. Shizenshigen no kyodokanriseido toshiteno komonzu [commons as a co-management system of natural resources]. In *Komonzu no shakaigaku* [Sociology of the commons], edited by M. Inoue, and T. Miyauchi, 1-28. Tokyo: Shin-yo-sha [in Japanese].

IUCN. 1994. *Guidelines for Protected Areas Management Categories*. Gland, Switzerland: IUCN.

IUCN. 2000. *Financing Protected Areas*. A report by the Financing Protected Areas Task Force of the World Commission on Protected Areas (WCPA) of IUCN, in collaboration with the Economics Unit of IUCN. Gland, Switzerland; Cambridge, UK: IUCN.

IUCN, UNEP, and WWF. 1980. *World Conservation Strategy: Living Resource Conservation for Sustainable Development*. International Union for Conservation of Nature and Natural Resources, United Nations Environment Programme, and World Wildlife Fund.

IUCN, UNEP, and WWF. 1991. *Caring for the Earth: A Strategy for Sustainable Living*. Gland, Switzerland: The World Conservation Union, United Nations Environment Programme, and World Wide Fund For Nature.

Jamal, T.B., and D. Getz. 1995. Collaboration Theory and Community Tourism Planning. *Annals of Tourism Research* 22(1): 186-204.

James, S.P. 2001. An Institutional Approach to Protected Area Management Performance. In *The Politics and Economics of Park Management*, edited by T.L. Anderson, and A. James, 3-27. Lanham: Rowman & Littlefield.

Janzen, D.H. 2001. Good Fences Make Good Neighbours: Area de Conservacion Guanacaste, Costa Rica. *Parks* 11(2): 41-49.

Jeanrenaud, S. 1999. People-Oriented Conservation: Progress to Date. In *Partnership for Protection: New Strategies for Planning and Management for Protected Areas*, edited by S. Stolton, and N. Dudley, 126-134. London: Earthscan.

Jones, J.R. 1992. Environmental Issues and Policies in Costa Rica: Control of Deforestation. *Policy Studies Journal* 20(4): 679-694.

Kaimowitz, D. 2004. Keynote Address at the Tenth Biennial Conference of the International Association for the Study of Common Property, Oaxaca, Mexico, August 10, 2004.

Kato, M. 2001. Kokuritsukoen no Tochishoyusha wa Koenriyosha wo Haijodekiruka?: Kokuritsukoen toshiteno Shiyuchiriyo no Genkai to Kadai [Can land owners within national parks exclude park users? Limitations and challenges of using private lands as national parks]. *Yokohama Kokusaikeizaihogaku* [Yokohama international economics and law] 9(3): 121-143 [in Japanese].

Kellert, S.R. 1996. *The Value of Life: Biological Diversity and Human Society*. Washington, D.C.; Covelo, CA: Island Press.

Kellert, S.R., J.N. Mehta, S.A. Ebbin, and L.L. Lichtenfeld. 2000. Community Natural Resource Management: Promise, Rhetoric, and Reality. *Society and Natural Resources* 13: 705-715.

Kennedy, J.J. 1985. Conceiving Forest Management as Providing for Current and Future Social Value. *Forest Ecology and Management* 13: 121-132.

Khadka, D., and S.K. Nepal. 2010. Local Responses to Participatory Conservation in Annapurna Conservation Area, Nepal. *Environmental Management* 45: 351-362.

Kitamura, K., and G. Cao. 2003. Community Forestry in Yunnan Province, *China Environment Series* 6: 116-119.

Kitamura, K., and R.A. Clapp. 2004. *Grassroots Nature Reserves and Common Property Protected Areas*. Paper presented at “The Commons in an Age of Global Transition: Challenges, Risks and Opportunities”, the Tenth Conference of the International Association for the Study of Common Property, Oaxaca, Mexico, August 9-13.

Kleinn, C., L. Corrales, and D. Morales. 2002. Forest Area in Costa Rica: A Comparative Study of Tropical Forest Cover Estimates over Time. *Environmental Monitoring and Assessment* 73: 17-40.

Kull, C.A., C.K. Ibrahim, and T.C. Meredith. 2007. Tropical Forest Transition and Globalization: Neo-Liberalism, Migration, Tourism, and International Conservation Agendas. *Society and Natural Resources* 20: 723-737.

Kunimoto, I., ed. 2004. *Kosuta rica wo shirutameno 55 sho* [55 chapters for knowing Costa Rica].Tokyo: Akashi Shoten [in Japanese].

Laarman, J.G., and R.R. Perdue.1989. Tropical Science and Tourism: The Case of OTS in Costa Rica. *Tourism Management* 10(1): 29-38.

Lal, P., H. Lim-Applegate, and M. Scoccimarro. 2001. The Adaptive Decision-Making Process as a Tool for Integrated Natural Resource Management: Focus, Attitudes, and Approach. *Conservation Ecology* 5(2): 11.

Landell-Mills, N., and T.I. Porras. 2002. *Silver Bullet or Fool’s Gold? A Global Review of Markets for Forest Environmental Services and Their Impact on the Poor*. London: International Institute for Environment and Development.

Langholz, J. 1996. Economics, Objectives, and Success of Private Nature Reserves in Sub-Saharan Africa and Latin America. *Conservation Biology* 10(1): 271-280.

Langholz, J., and J. Lassoie. 2001. Combining Conservation and Development on Private Lands: Lessons from Costa Rica. *Environment, Development and Sustainability* 3: 309-322.

Langholz, J., J. Lassoie, and J. Schelhas. 2000. Incentives for Biological Conservation: Costa Rica’s Private Wildlife Refuge Program. *Conservation Biology* 14(6): 1735-1743.

Lasswell, H.D. 1977. *Harold D. Lasswell on Political Sociology* (edited and with an introduction by Dwaine Marvick). Chicago: University of Chicago Press.

Lee, K.N. 1999. Appraising Adaptive Management. *Conservation Ecology* 3(2): 3.

Legacy Panel. 1999. *Sustaining Our Protected Areas System*. Final Report of the Legacy Panel: The Panel’s Recommendations for Enhancing Long-Term Sustainability of British Columbia’s Protected Areas System.

Leroux, S.J., M.A. Krawchuk, F. Schmiegelow, S.G. Cumming, K. Lisgo, L.G. Anderson, and M. Petkova. 2010. Global Pprotected Areas and IUCN Designations: Do the Categories Match the Conditions? Biological Conservation 143: 609-616.

Locatelli, B., V. Rojas, and Z. Salinas. 2008. Impacts of Payments for Environmental Services on Local Development in Northern Costa Rica: A Fuzzy Multi-Criteria Analysis. *Forest Policy and Economics* 10: 275-285.

Locke, H., and P. Dearden. 2005. Rethinking Protected Area Categories and the New Paradigm. *Environmental Conservation* 32(1): 1-10.

Lockwood, M. 2010. Good Governance for Terrestrial Protected Areas: A Framework, Principles and Performance Outcomes. *Journal of Environmental Management* 91: 754-766.

Lovejoy, T.E. 2006. Protected Areas: A Prism for a Changing World. Trends in Ecology and Evolution 21(6): 329-333.

MacKinnon, K. 2001. Editorial – Integrated Conservation and Development Projects, Can They Work? *Parks* 11(2): 1-5.

McCay, B.J. 2001. Community and the Commons: Romantic and Other Views. In *Communities and the Environment: Ethnicity, Gender, and the State in Community-Based Conservation*, edited by A. Agrawal, and C.C. Gibson, 180-191. New Brunswick, NJ: Rutgers University Press.

McCay, B.J., and J.M. Acheson, eds. 1987. *The Questions of the Commons: The Culture and Ecology of Communal Resources*. Tucson: University of Arizona Press.

McKean, M.A. 1992. Management of Traditional Common Lands (Iriaichi) in Japan. In *Making the Commons Work: Theory, Practice, and the Policy*, edited by D.W. Bromley, D. Feeny, M.A. McKean, P. Peters, J.L. Gilles, R.J. Oakerson, C.F. Runge, and J.T. Thompson, 63-98. San Francisco: ICS Press.

McKean, M.A. 2000. Common Property: What Is It, What Is It Good for, and What Makes It Work? In *People and Forests: Communities, Institutions, and Governance*, edited by C.C. Gibson, M.A. McKean, and E. Ostrom, 27-55. Cambridge, Mass: MIT Press.

McNeely, J. 1999. Protected Area Institutions. In *Partnership for Protection: New Strategies for Planning and Management for Protected Areas*, edited by S. Stolton, and N. Dudley, 195-204. London: Earthscan.

Mathieson, A., and G. Wall. 1982. *Tourism: Economic, Physical and Social Impacts*. London; New York: Longman.

Meinzen-Dick, R., and A. Knox. 2001. Collective Action, Property Rights, and Devolution of Natural Resource Management: A Conceptual Framework. In *Collective Action, Property Rights and Develution of Natural Resource Management – Exchange of Knowledge and Implications for Policy*, Proceedings of the International Conference, June 21-25, 1999, Puerto Azul, The Philippines, edited by R. Meinzen-Dick, A. Knox, and M. Di Gregorio, 41-73.

Mercer, D. 1994. Native Peoples and Tourism: Conflict and Compromise. In *Global Tourism: The Next Decade*, edited by W.F. Theobald, 124-145. Oxford: Butterworth-Heinemann.

Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-being: Synthesis. Washington, DC: Island Press.

Miranda, M. 2003. *Institutional Capacities for Sustainable Progress: Experiences from Costa Rica*. Utrecht: Universiteit Utrecht.

Mitsui, S. 1997. Commons and River Basins Seen from Forest: Their History and Present Perspectives. *Journal of Environmental Sociology* 3: 33-46 [in Japanese with English abstract].

Mitsumata, G., and T. Murota. 2005. Comparative Study on Common Lands in Eight Countries and Regions in Japan, UK and Ireland from the Viewpoint of Changing Livelihood. *Bulletin of the National Museum of Japanese History* 123: 253-323 [in Japanese].

Miyauchi, T. 2001. *Komonzu no Shakaigaku* [Sociology of the commons]. In Shizen-kankyo to kankyo-bunka [Natural environment and environmental culture], edited by H. Torigoe, 25-46. Tokyo: Yuhikaku [in Japanese].

Moore, S.A., and M. Walker. 2008. Progressing the Evaluation of Management Effectiveness for Protected Areas: Two Australian Case Studies. Journal of Environmental Policy & Planning 10(4): 405-421.

Moragrega, L. 2004. Tourist Expansion and Development of Rural Communities: The Case of Monteverde, Costa Rica. *Mountain Research and Development* 24(3): 202-205.

Morse, W.C., J.L. Schedlbauer, S.E. Sesnie, B. Finegan, C.A. Harvey, S.J. Hollenhorst, K.L. Kavanagh, D. Stoian, and J. D. Wulfhorst. 2009. Consequences of Environmental Service Payments for Forest Retention and Recruitment in a Costa Rican Biological Corridor. *Ecology and Society* 14(1): 23.

Mosse, D. 2001. 'People's Knowledge', Participation and Patronage: Operations and Representations in Rural Development. In *Participation: The New Tyranny?*, edited by B. Cooke, and U. Kothari, 16-35. London; New York: Zed Books.

Mulongoy, K.J., and S.P. Chape, eds. 2004. *Protected Areas and Biodiversity: An overview of key issues*. Montreal: CBD Secretariat; Cambridge, UK: UNEP-WCMC.

Munos, R. 2004. *Effectos del Programa Pago por Servicios Ambientales en las Condiciones de Vida de los Campesinos de la Penninsula de Osa*. Trabajo final de graduación presentado como requisito parcial para optar al título de Magíster en Evaluación de Programas y Proyectos de Desarrollo. San Jose: Universidad de Costa Rica.

Murota, T., and G. Mitsumata. 2004. *Iriai rin-ya to komonzu* [Irian forests and commons]. Tokyo: Nihon-hyoronsha [in Japanese].

Murota, T., M. Sakagami, G. Mitsumata, and R. Izumi. 2003. *Kankyo Keizaigaku no Shinseiki* [New century of environmental economics]. Tokyo: Chuokeizaisha [in Japanese].

Murphree, M. 2002. Protected Areas and the Commons. *Common Property Resource Digest* 60: 1-3.

Murphy, P.E. 1988. Community Driven Tourism Planning. *Tourism Management* 9(2): 96-104.

Nash, R. 1989. *The Rights of Nature: A History of Environmental Ethics*. Madison, WI: The University of Wisconsin Press.

National Research Council. 1986. *Proceedings of the Conference on Common Property Resource Management (April 21-26, 1985, Annapolis)*. Maryland. Washington, D.C.: National Academy Press.

Nelson, J.G. 1997. Parks and Protected Areas and Sustainable Development. In *Changing Parks: The History, Future and Cultural Context of Parks and Heritage Landscapes*, edited by J.S. Marsh, and B.W. Hodgins, 279-294. Toronto: Natural Heritage / Natural History Inc.

Netting, R.M. 1976. What Alpine Peasants Have in Common: Observations on Communal Tenure in a Swiss Village. *Human Ecology* 4(2): 135-146.

Newcomer, Q. 1999. The Monteverde Community: A Whole Greater than Its Parts. *Social Education* 63(2): 87-88.

Nkhata, B.A., and C. Breen. 2010. A Framework for Exploring Integrated Learning Systems for the Governance and Management of Public Protected Areas. *Environmental Management* 45: 403-413.

Noss, R.F. 2001. Beyond Kyoto: Forest Management in a Time of Rapid Climate Change. *Conservation Biology* 15(3): 578-590.

Oakerson, R.J. 1986. A Model for the Analysis of Common Property Problems. In *Proceedings of the Conference on Common Property Resource Management (April 21-26, 1985, Annapolis)*, by National Research Council, 13-30. Maryland. Washington, D.C.: National Academy Press.

Oakerson, R.J. 1992. Analyzing the Commons: A Framework. In *Making the Commons Work: Theory, Practice, and the Policy*, edited by D.W. Bromley, D. Feeny, M.A. McKean, P. Peters, J.L. Gilles, R.J. Oakerson, C.F. Runge, and J.T. Thompson, 41-59. San Francisco: ICS Press.

Obando, V. 2002. *Biodiversidad en Costa Rica: Estado del Conocimiento y Gestion*. Heredia, Costa Rica: Instituto Nacional de Biodiversidad.

OECC. 1994. *Kosuta Rika Jireichi Chosa Hokokusho* [Case study report on Costa Rica]. Tokyo: Overseas Environmental Cooperation Center, Japan [in Japanese].

OESP. 1997. *Who Are the Question-makers? A Participatory Evaluation Handbook*. Office of Evaluation and Strategic Planning, United Nations Development Programme: New York.

Ostrom, E. 1986. Issues of Definition and Theory: Some Conclusions and Hypotheses. In *Proceedings of the Conference on Common Property Resource Management (April 21-26,*

1985 Annapolis), by National Research Council, 599-615. Maryland. Washington, D.C.: National Academy Press.

Ostrom, E. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

Ostrom, E., J. Burger, C.B. Field, R.B. Norgaard, and D. Policansky. 1999. Revisiting the Commons: Local Lessons, Global Challenges. *Science* 284: 278-282.

Ostrom, E., T. Dietz, N. Dolsak, P.C. Stern, S. Stonich, and E.U. Weber, eds. 2002. *The Drama of the Commons*. Washington, D.C.: National Academy Press.

Ostrom, E., R. Gardner, and J. Walker. 1994. *Rules, Games, and Common-Pool Resources*. Ann Arbor: University of Michigan Press.

Pagiola, S. 2008. Payments for environmental services in Costa Rica. *Ecological Economics* 65: 712-724.

Palmer, P. 1993. *"What happen": A Folk-History of Costa Rica's Talamanca Coast*. San Jose, Costa Rica: Publications in English S.A.

Parks Canada Agency. 2000. *"Unimpared for Future Generations"? Protecting Ecological Integrity with Canada's National Parks*. Volume I: A Call to Action. Report of the Panel on the Ecological Integrity of Canada's National Parks. Ottawa, ON.

Peepre, J., and P. Dearden. 2002. The Role of Aboriginal Peoples. In *Parks and Protected Areas in Canada: Planning and Management*, edited by P. Dearden, and R. Rollins, 323-353. Second Edition. Toronto: Oxford University Press.

Pelling, M. 2007. Learning from Others: The Scope and Challenges for Participatory Disaster Risk Assessment. *Disasters* 31(4): 373-385.

Phillips, A. 1997. Landscape Approaches to National Parks and Protected Areas. In *National Parks and Protected Areas: Keystones to Conservation and Sustainable Development*, edited by J.G. Nelson, and R. Serafin, 31-42. Berlin; New York: Springer.

Piotto, D. 2007. Growth of Native Tree Species Planted in Open Pasture, Young Secondary Forest and Mature Forest in Humid Tropical Costa Rica. *Journal of Tropical Forest Science* 19(2): 86-96.

Place, S.E. 1998. How Sustainable is Ecotourism in Costa Rica? In *Sustainable Tourism: A Geographical Perspective*, edited by C.M. Hall, and A.A. Lew, 107-118. Harlow, UK: Longman.

Porras, I., and N. Neves. 2006. Costa Rica – National PES programme. Markets for Watershed Services – Country Profile. [http://www.watershedmarkets.org/documents/Costa_Rica_National_PES_eng.pdf].

Postel, S.L., and B.H. Thompson. 2005. Watershed Protection: Capturing the Benefits of Nature's Water Supply Services. *Natural Resources Forum* 29: 98-108.

Poteete, A.R. 2004. What Do You Mean by That? In Search of Conceptual Consistency. *Common Property Resource Digest* 68: 1-4.

Pretty, J., and H. Ward. 2001. Social Capital and the Environment. *World Development* 29(2): 209-227.

Rainforest Alliance. n.d. Eco-Index. [http://www.eco-index.org].

Rancoli, C. 2006. Ethnographic and Participatory Approaches to Research on Farmers' Responses to Climate Predictions. *Climate Research* 33: 81-99.

Ribot, J.C. 2004. Say What You Mean. *Common Property Resource Digest* 68: 4-5.

Rieser, A. 1997. Property Rights and Ecosystem Management in U.S. Fisheries: Contracting for the Commons. *Ecology Law Quarterly* 24(4): 813-832.

Rivera, J. 2004. Institutional Pressures and Voluntary Environmental Behavior in Developing Countries: Evidence from the Costa Rican Hotel Industry. *Society and Natural Resources* 17: 779-797.

Robbins, P., K. McSweeney, A.K. Chhangani, and J.L. Rice. 2009. Conservation as It Is: Illicit Resource Use in a Wildlife Reserve in India. *Human Ecology* 37:559–575.

Rodrigues, A.S.L., S.J. Andelman, M.I. Bakarr, L. Boitani, T.M. Brooks, R.M. Cowling, L.D.C. Fishpool, G.A.B. da Fonseca, K.J. Gaston, M. Hoffmann, J.S. Long, P.A. Marquet, J.D. Pilgrim,

R.L. Pressey, J. Schipper, W. Sechrest, S.N. Stuart, L.G. Underhill, R.W. Waller, M.E.J. Watts, and X. Yan. 2004. Effectiveness of the global protected area network in representing species diversity. *Nature* 428: 640-643.

Rodriguez, J.M. 1997. Costa Rican Parks: Fields of Conflict. *Forum for Applied Research and Public Policy* 12(1): 49-52.

Rojas, M., and B. Aylward. 2003. *What Are We Learning from Experiences with Markets for Environmental Services in Costa Rica? A Review and Critique of the Literature*. London: International Institute for Environment and Development.

Rolston, H. 1985. Valuing Wilderness. *Environmental Ethics* 7: 23-48.

Rolston, H. 1988. Human Values and Natural Systems. *Society and Natural Resources* 1: 271-283.

Roth, R. 2004. Conceptual Consistency to Conceptual Clarity: The Situating of Concepts and Terms for Analytical Strength. *Common Property Resource Digest* 68: 9-10.

Salafsky, N., and E. Wollenberg. 2000. Linking Livelihoods and Conservation: A Conceptual Framework and Scale for Assessing the Integration of Human Needs and Biodiversity. *World Development* 28(8): 1421-1438.

Sanchez-Azofeifa, G.A., G.C. Daily, A.S.P. Pfaff, and C. Busch. 2003. Integrity and Isolation of Costa Rica's National Parks and Biological Reserves: Examining the Dynamics of Land-Cover Change. *Biological Conservation* 109: 123-135.

Sanchez-Azofeifa, G.A., R.C. Harriss, and D.L. Skole. 2001. Deforestation in Costa Rica: A Quantitative Analysis Using Remote Sensing Imagery. *Biotropica* 33(3): 378-384.

Sanchez-Azofeifa, G.A., B. Rivard, J. Calvo, and I. Moorthy. 2002. Dynamics of Tropical Deforestation around National Parks: Remote Sensing of Forest Change on the Osa Peninsula of Costa Rica. *Mountain Research and Development* 22(4): 352-358.

Sandoval, C. 2004. Contested Discourses on National Identity: Representing Nicaraguan Immigration to Costa Rica. *Bulletin of Latin American Research* 23(4): 434-445.

Saterson, K.A., N.L. Christensen, R.B. Jackson, R.A. Kramer, S.L. Pimm, M.D. Smith, and J.B. Wiener. 2004. Disconnects in Evaluating the Relative Effectiveness of Conservation Strategies. *Conservation Biology* 18(3): 597-599.

Sato, J. 2003. Nature and the Significance of Case Analysis in Development Studies. *Journal of International Development Studies* 12(1): 1-15 [in Japanese with English abstract].

Sayer, J.A., and B. Campbell. 2001. Research to Integrate Productivity Enhancement, Environmental Protection, and Human Development. *Conservation Ecology* 5(2): 32

Scheyvens, R. 2007. Exploring the Tourism-Poverty Nexus. *Current Issues in Tourism* 10(2): 231-254.

Schilcher, D. 2007. Growth Versus Equity: The Continuum of Pro-Poor Tourism and Neoliberal Governance. *Current Issues in Tourism* 10(2): 166-193.

Schlager, E., and E. Ostrom. 1992. Property-Rights Regimes and Natural Resources: A Conceptual Analysis. *Land Economics* 68(3): 249-262.

Schlüter, R.G. 1994. Tourism Development: A Latin American Perspective. In *Global Tourism: The Next Decade*, edited by W.F. Theobald, 246-260. Oxford: Butterworth-Heinemann.

Schmitt, C.B., N.D. Burgess, L. Coad, A. Belokurov, C. Besançon, L. Boisrobert, A. Campbell, L. Fish, D. Gliddon, K. Humphries, V. Kapos, C. Loucks, I. Lysenko, L. Miles, C. Mills, S. Minnemeyer, T. Pistorius, C. Ravilious, M. Steininger, and G. Winkel. 2009. Global Analysis of the Protection Status of the World's Forests. *Biological Conservation* 142(10): 2122-2130.

Schönhuth, M., and U. Kievelitz. 1994. *Participatory Learning Approaches – Rapid Rural Appraisal; Participatory Appraisal; An Introductory Guide*. Postfach, Germany: GTZ.

Science Council of Japan. 2001. *Chikyu Kankyo, Ningen Seikatsu ni Kakawaru Nogyo oyobi Shinrin no Tamentekina Kinono Hyoka ni Tsuite* [Evaluation of multiple function of agriculture and forests in terms of global environment and human life]. Report submitted to Minister of Agriculture, Forestry and Fisheries, Japan [in Japanese].

Scott, J.M., M. Murray, R.G. Wright, B. Csuti, P. Morgan, and R.L. Pressey. 2001. Representation of Natural Vegetation in Protected Areas: Capturing the Geographic Range. *Biodiversity and Conservation* 10: 1297-1301.

Scott, J.S. 1998. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven; London: Yale University Press.

Segra-Bonilla, O. 2003. Competitiveness, Systems of Innovation and the Learning Economy: The Forest Sector in Costa Rica. *Forest Policy and Economics* 5: 373-384.

Sellars, R.W. 1997. *Preserving Nature in the National Parks: A History*. New Haven; London: Yale University Press.

Selman, P. 2009. Conservation designations—Are they fit for purpose in the 21st century? *Land Use Policy* 26: S142-S153.

Shikida, A., and M. Morishige. 2001. Ecotourism ni Yoru Chiiki no Jzokutekihatten no Kanosei [Possibility of local sustainable development by ecotourism]. *Annals of Society for Environmental Economics and Policy Studies* 6: 200-215 [in Japanese].

Shukla, S.R., and A.J. Sinclair. 2010. Strategies for Self-organization: Learning from a Village-level Community-based Conservation Initiative in India. *Human Ecology* 38: 205–215

Silva, E. 2003. Selling Sustainable Development and Shortchanging Social Ecology in Costa Rican Forest Policy. *Latin American Politics and Society* 45(3): 93-127.

Simmons, D.G. 1994. Community Participation in Tourism Planning. *Tourism Management* 15(2): 98-108.

SINAC-MINAE. 2003. *Informe Nacional sobre el Sistema de Areas Silvestres Protegidas*. San Jose, Costa Rica: Gerencia de Areas Silvestres Protegidas, Sistema Nacional de Areas de Conservacion, Ministerio del Ambiente y Energia.

Sittenfeld, A.M., and A. Lovejoy. 1998. Biodiversity Prospecting Frameworks: The INBio Experience in Costa Rica. In *Protection of Global Biodiversity: Converging Strategies*, edited by L.D. Guruswamy, and J.A. McNeely, 223-244. Durham; London: Duke University Press.

Slocombe, D.S. 1998. Defining Goals and Criteria for Ecosystem-Based Management. *Environmental Management* 22(4): 483-493.

Snider, A.G., S.K. Pattanayak, E.O. Sills, and J.L. Schuler. 2003. Policy Innovations for Private Forest Management and Conservation in Costa Rica. *Journal of Forestry* 101(5): 18-23.

Social Profit Network.n.d. *ANAI*. [http://www.socialprofitnetwork.org/pdfs/anai.pdf].

Solorzano, R., R. de Camino, R. Woodward, J. Tosi, V. Watson, A. Vasquez, C. Villalobos, J. Jimenez, R. Repetto, and W. Cruz. 1991. Accounts Overdue: Natural Resource Depletion in Costa Rica. Washington, D.C.: World Resources Institute.

Soluri, J. 2002. Accounting for Taste: Export Bananas, Mass Markets, and Panama Disease. *Environmental History* 7(3): 386-410.

Soule, M.E. 1995. The Social Siege of Nature. In *Reinventing Nature? Responses to Postmodern Deconstruction*, edited by M.E. Soule and G. Lease, 137-169. Washington, DC: Island Press.

Stem, C.J., J.P. Lassoie, D.R. Lee, D.D. Deshler, and J.W. Schelhas. 2003. Community Participation in Ecotourism Benefits: The Links to Conservation Practices and Perspectives. *Society and Natural Resources* 16: 387-413.

Stern, P.C., T. Dietz, N. Dolsak, E. Ostrom, and S. Stonich. 2002. Knowledge and Questions After 15 Years of Research. In *The Drama of the Commons*, edited by E. Ostrom, T. Dietz, N. Dolsak, P.C. Stern, S. Stonich, and E.U. Weber, 445-489. Washington, D.C.: National Academy Press.

Stevens, S. 1997. The Legacy of Yellowstone. In *Conservation through Cultural Survival: Indigenous Peoples and Protected Areas*, edited by S. Stevens, 13-32. Washington, DC: Island Press.

Stevens, S. 2001. Fieldwork as Commitment. *Geographical Review* 91(1-2): 66-73.

Sun, M. 1988. Costa Rica's Campaign for Conservation. *Science* 239(4846): 1366-1369.

Sundberg, J. 1998. NGO Landscapes in the Maya Biosphere Reserve, Guatemala. *Geographical Review* 88(3): 388-412.

Swift, B. 2004. Private Lands Conservation in Latin America: The Need for Enhanced Legal Tools and Incentives. *Journal of Environmental Law and Litigation* 19(1): 85-139.

Swift, B., V. Arias, S. Bass, C.M. Chacon, A. Cortes, M. Gutierrez, V. Maldonado, M. Milano, L. Nunes, M. Tobar, V. Sanjines, P. Solano, and V. Theulen. 2004. Private Lands Conservation in Latin America: The Need for Enhanced Legal Tools and Incentives. *Journal of Environmental Law and Litigation* 19(1): 85-139.

Tabeta, M. 1990. *Komonzu no Keizaigaku* [Economics of the commons]. Tokyo: Gakuyo Shobo.

Takasaki, Y., B.L. Barham, and O.T. Coomes. 2000. Rapid Rural Appraisal in Humid Tropical Forests: An Asset Possession-Based Approach and Validation Methods for Wealth Assessment among Forest Peasant Households. *World Development* 28 (11): 1961-1977.

Tanaka, K. 1999. Umi to Riku no Hazama ni Ikiru [Living between the sea and land]. In *Shizen wa Dare no Monoka* [Who owns nature?], edited by T. Akimichi, 110-135. Kyoto: Showado [in Japanese].

Taylor, G. 1995. The Community Approach: Does It Really Work? *Tourism Management* 16(7): 487-489.

Timko, J., and T. Satterfield. 2008. Criteria and Indicators for Evaluating Social Equity and Ecological Integrity in National Parks and Protected Areas. *Natural Areas Journal* 28(3): 307-319.

Timko, J.A., and J.L. Innes. 2009. Evaluating Ecological Integrity in National Parks: Case Studies from Canada and South Africa. *Biological Conservation* 142: 676-688.

Torigoe, H. 1997. *Kankyo Shakaigaku no Riron to Jissen* [theory and practice of environmental sociology]. Tokyo: Yuhikaku [in Japanese].

UNEP. n.d. *Ecolabels in the Tourism Industry*. United Nations Environment Programme – Industry and Environment.

University for Peace. 1995. *El Rodeo: A Forest for Humanity*. San Jose, Costa Rica: University for Peace.

Van der Duim, V. R., and J. Caalders. 2008. Tourism Chains and Pro-poor Tourism Development: An Actor-Network Analysis of a Pilot Project in Costa Rica. *Current Issues in Tourism* 11(2):109-125.

Vatn, A. 2010. An Institutional Analysis of Payments for Environmental Services. *Ecological Economics* 69: 1245-1252.

Wadsworth, Y. 1998. What is Participatory Action Research? *Action Research International*, Paper 2. [http://www.scu.edu.au/schools/gcm/ar/ari/p-ywadsworth98.html].

WCED. 1987. *Our Common Future*. World Commission on Environment and Development. Oxford; New York: Oxford University Press.

Wearing, S., and J. Neil. 1999. *Ecotourism: Impacts, Potentials and Possibilities*. Oxford: Butterworth-Heinemann.

Weaver, D.B. 1999. Magnitude of Ecotourism in Costa Rica and Kenya. *Annals of Tourism Research* 26(4): 792-816.

Weinberg, A., S. Bellows, and D. Ekster. 2002. Sustaining Ecotourism: Insights and Implications from Two Successful Case Studies. *Society and Natural Resources* 15: 371-380.

Wells, M., and K. Brandon. 1992. *People and Parks: Linking Protected Area Management with Local Communities*. Washington, D.C.: World Bank, World Wildlife Fund, and USAID.

Wight, P. 1998. Tools for Sustainability Analysis in Planning and Managing Tourism and Recreation in the Destination. In *Sustainable Tourism: A Geographical Perspective*, edited by C.M. Hall, and A.A. Lew, 75-91. Harlow, UK: Longman.

Williams, D.R., and M.E. Patterson. 1996. Environmental Meaning and Ecosystem Management: Perspectives from Environmental Psychology and Human Geography. *Society and Natural Resources* 9: 507-521.

Williams, D.R., M.E. Patterson, J.W. Roggenbuck, and A.E. Watson. 1992. Beyond the Commodity Metaphor: Examining Emotional and Symbolic Attachment to Place. *Leisure Sciences* 14: 29-46.

Williams, P.W., and A. Gill. 1994. Tourism Carrying Capacity Management Issues. In *Global Tourism: The Next Decade*, edited by W.F. Theobald, 174-187. Oxford: Butterworth-Heinemann.

Wilshusen, P.R., S.R. Brechin, C.L. Fortwangler, and P.C. West. 2002. Reinventing a Square Wheel: Critique of a Resurgent "Protection Paradigm" in International Biodiversity Conservation. *Society and Natural Resources* 15: 17-40.

Wilson, S., D.R. Fesenmaier, J. Fesenmaier, and J.C. van Es. 2001.Factors for Success in Rural Tourism Development. *Journal of Travel Research* 40: 132-138.

Wittayapak, C., and P. Dearden. 1999. Decision-Making Arrangements in Community-Based Watershed Management in Northern Thailand. *Society and Natural Resources* 12(7): 673-691.

Wittemyer, G., P. Elsen, W.T. Bean, A. Coleman, O. Burton, and J.S. Brashares. 2008. Accelerated Human Population Growth at Protected Area Edges. *Science* 321: 123-126.

World Bank. n.d. Costa Rica at a Glance. [http://devdata.worldbank.org/AAG/cri_aag.pdf].

WRI, IUCN, and UNEP. 1992. *Global Biodiversity Strategy: Guidelines for Action to Save, Study, and Use Earth's Biotic Wealth Sustainably and Equitably*. World Resources Institute, The World Conservation Union, and United Nations Environment Programme.

Wunder, S. 2005. *Payments for Environmental Services: Some Nuts and Bolts*. CIFOR Occasional Paper 42. Bogor, Indonesia: Center for International Forestry Research.

Wunder, S. 2006. Are Direct Payments for Environmental Services Spelling Doom for Sustainable Forest Management in the Tropics? *Ecology and Society* 11(2): 23.

Wunder, S. 2007. The Efficacy of Payments for Environmental Services in Tropical Conservation. *Conservation Biology* 21(1): 48-58.

Wunder, S., S. Engel, and S. Pagiola. 2008. Taking Stock: A Comparative Analysis of Payments for Environmental Services Programs in Developed and Developing Countries. *Ecological Economics* 65: 834-852.

Yandle, T. 2007. Understanding the Consequences of Property Rights Mismatches: A Case Study of New Zealand's Marine Resources. *Ecology and Society* 12(2): 27.

Yin, R.K. 2003a. *Case Study Research: Design and Methods*. Third edition. Thousand Oaks, CA: Sage.

Yin, R.K. 2003b. *Applications of Case Study Research*. Second edition. Thousand Oaks, CA: Sage.

Zimmerer, K.S. 2000. The Reworking of Conservation Geographies: Nonequilibrium Landscapes and Nature-Society Hybrids. *Annals of the Association of American Geographer* 90(2): 356-369.

Zimmerman, E. 1951. *World resources and industries*. New York: Harper and Row.

Zupancic-Vicar, M. 1997. Parks for Life: An Action Plan for the Protected Areas of Europe. In *National Parks and Protected Areas: Keystones to Conservation and Sustainable Development*, edited by J.G. Nelson, and R. Sarafin, 151-157. NATO ASI series: Series G, Ecological Sciences Vol. 40. Berlin; New York: Springer.