

**Evaluating Community Incentives
For Biodiversity Conservation In Protected Areas In Nepal**

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Abstract

Recently, conservation efforts have expanded to incorporate delivering social and economic benefits to communities nearby or within protected areas. Benefits can generate incentives to encourage conservation support; however, such incentive-based programs (IBPs) have been criticised for failures in achieving both conservation and development goals. Many of the criticisms centre on deficiencies in benefit distribution and connection with conservation.

This research highlights the limitations and successes of selected IBPs in Nepal. The protected area approaches compared are the buffer zone concept in Royal Chitwan National Park and the biosphere reserve concept in Annapurna Conservation Area. The research finds that benefits continue to be unfairly and unequally distributed and the connection between benefits and conservation is not recognized unless benefits are directly dependent on natural resources. Illegal extraction and widespread support for environmentally destructive development suggest IBPs are not having the desired effect in gaining long term local support for conservation.

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Glossary

ACA	Annapurna Conservation Area
ACAP	Annapurna Conservation Area Project
APU	Anti-poaching Unit
BCC	Biodiversity Conservation Centre
BZMC	Buffer Zone Management Committee
BSU	Buffer Zone Support Unit
CAMC	Conservation Area Management Committee
CAMPFIRE	Communal Areas Management Program for Indigenous Resources
CBC	Community-Based Conservation
CBD	Convention on Biological Diversity
CBS	Central Bureau of Statistics
CITES	Convention on International Trade in Endangered Species
CPN	Communist Party of Nepal
DNPWC	Department of National Parks and Wildlife Conservation
DV	Destination Village
HMG	His Majesty's Government
HMGN	His Majesty's Government of Nepal
IBC	Incentive-Based Conservation
IBP	Incentive-Based Program
ICDP	Integrated Conservation and Development Project
INGO	International Non-Government Organization
IUCN	The World Conservation Union
KMTNC	King Mahendra Trust for Nature Conservation
LIRD	Luangwa Integrated Resource Development Project
MFSC	Ministry of Forests and Soil Conservation
MI	Mountain Institute
NEPAP	National Environmental Policy and Action Plan
NGO	Non-Government Organization
NPWCA	National Parks and Wildlife Conservation Act
NR	Nepali Rupees
ORV	Off-Route Village
PPP	People Park Program
PCP	Participatory Conservation Program
RCNP	Royal Chitwan National Park
RNA	Royal Nepal Army
TAL	Tera Arc Landscape Program
TRCP	Tiger / Rhino Conservation Project
UCO	Unit Conservation Offices
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Education, Scientific and Cultural Organization
USAID	United States Agency for International Development
ORV	Off-route Village

VDC	Village Development Committee
WWF	World Wildlife Fund
WWF-Nepal	World Wildlife Fund - Nepal

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Chapter 1: Introduction

1.1 Rationale

In recent decades, concern has grown globally over threats to natural resources and corresponding rates of species extinction. As the human population continues to increase, the stress placed upon the environment from demands on natural resources may accelerate the threat of extinction to native ecosystems. Perhaps nowhere is the conflict between increasing human populations and the environment as great as in developing countries. Many developing nations are located in tropical regions representing much of the world's biological diversity. As most rural residents rely on natural resources for subsistence, conservation plays an important role in ensuring the future availability of resources (Gbadegesin and Ayileka 2000; Kapoor 2001) amidst the constraints presented by rapid population growth, severe poverty, technology and globalization (Terborgh 2000; Sah and Heinen 2001; Tanner 2003). Consequently, conservation efforts in developing nations are perceived to be essential, but to be implemented in a practical sense require a delicate balance between satisfying the social and economic needs of rural communities while ensuring ecological persistence (Robinson 1993; Mitchell 1995).

The notion of protecting native ecological systems has developed in three phases distinguished in their motivations and approaches to conservation. According to Gbadegesin and Ayileka (2000), conservation approaches can be categorized into three distinct phases: (1) pre-colonial; (2) colonial and post-colonial; and, (3) modern late twentieth-century. The pre-colonial phase represents the period when conservation efforts consisted of indigenous resource management based on experience, spiritual beliefs, traditions, and necessity for subsistence. The colonial and post-colonial phase

signified a shift from traditional resource management practices to externally imposed, 'human-free' parks modeled after the North American approach. This approach has been coined by Blaikie and Jeanrenaud (1997) as a *classic* approach to conservation. When applied in the context of developing countries, where dense populations are spatially dispersed throughout rural areas and have a subsistence dependency on natural resources, classic forms of conservation have negative consequences for local inhabitants, such as human displacement, limitations to resource use, and access to traditional territories (West and Brechin 1991; Gbadegesin and Ayileka 2000; Newmark and Hough 2000; Salafsky and Wollenberg 2000; Schwartzman et al. 2000; Bruner et al. 2001; Kapoor 2001; Brown 2002; Bauer 2003). The social, cultural and economic implications of classic conservation have created negative attitudes among local residents, thereby limiting the capacity of such programs to actually protect the environment.

The most recent phase in conservation ideology attempts to address the limitations of the classic approach and signifies a move towards consideration of the needs of local residents in conservation planning and management. This period has involved various combinations of the traditional community natural resource management of the first phase with the government control of the second (Gbadegesin and Ayileka 2000).

Blaikie and Jeanrenaud (1997) identify two conservation strategies prevalent during this phase: *populist* and *neo-liberal*. A populist approach involves community participation in the planning and implementation of conservation projects (Blaikie and Jeanrenaud 1997). Community involvement is critical in establishing local support for conservation by ensuring plans are designed to suit subsistence needs and traditions (Gbadegesin and Ayileka 2000). In its most effective form, participation encompasses genuine

empowerment and creates community ownership of conservation outcomes (Brown 2002). Neo-liberal approaches attempt to create development incentives to encourage community environmental stewardship (Blaikie and Jeanrenaud 1997). The premise behind neo-liberal conservation is to establish an economic dependency on the existence of intact natural systems. A review of the literature suggests that participation and economic dependency, independently, are insufficient to achieve conservation objectives (Fiallo and Jacobson 1995; Gillingham and Lee 1999; Heinen and Mehta 1999; Songorwa 1999; Gbadegesin and Ayileka 2000; Newmark and Hough 2000; Kapoor 2001; Salafsky et al. 2001; Brown 2002; Timsina 2003). Conservation efforts need to incorporate economic development in conjunction with community involvement.

Over the past two decades, populist and neo-liberal approaches have been combined and implemented in new and existing conservation projects throughout the world. Applications of such incentive-based approaches in the context of protected areas can be broken down into two categories: biosphere reserves and core zones with surrounding buffer zones (Brandon 2002). Most new protected areas are designed as biosphere reserves which encompass existing human communities within boundaries. Biosphere reserves are zoned to allow for multiple use, with provisions for continued resource extraction on a sustainable basis (Brandon 1998b).

In recognition of the fundamental importance of community support in achieving conservation success and the social and economic implications of early attempts to conserve natural resources, buffer zones have been established around existing classic parks in an attempt to create incentives for conservation, while continuing to strictly protect the core zone. As exclusionary protected areas remain integral to the global effort

to conserve biodiversity, new core zones continue to be established in remote regions where flora and fauna are habitat specialists, endemic, or threatened with extinction (Brandon 1998b; Heinen and Shrestha 2006). Although ecological conditions may require exclusionary means within protected area boundaries, buffer zones are now often incorporated into the overall management approach at the outset. Buffer zones provide the dual benefit of reinforcing the protection role of the core zone by enlarging wildlife habitat and reducing encroachment and poaching, while improving local livelihoods through social and economic incentives (Salafsky 1994; Groom et al. 1999; Brandon 2002).

Recently, however, the ability of incentive-based programs (IBPs¹) to contribute to conservation goals in biosphere reserves and core / buffer zones has been questioned (Wells and Brandon 1993; Colchester 1997; Noss et al. 1999; Ferraro and Kiss 2002). Some critics even suggest a return to the exclusionary national park models of the past is the only way to guarantee the protection of biodiversity (Terborgh 1999). The goal of this research is to identify the limitations and successes of IBPs by evaluating the effectiveness of biosphere and core / buffer zone approaches in establishing incentives that generate community support for conservation. While many question the application of IBPs in developing countries as alternative approaches to biodiversity conservation and suggest conservation budgets could be better used elsewhere (Brandon 1998b; Terborgh 1999; Newmark and Hough 2000; Ferraro 2001), perhaps the best solution is to work on improving the shortcomings of the existing framework (Schwartzman et al. 2000; Brechin et al. 2002; Wilshusen et al. 2002).

¹ Abbreviations are listed in the Glossary starting on page x.

1.2 Research Aim

The central purpose of my research is to answer the following question: are social and economic benefits extended by protected area approaches in Nepal able to create incentives for conservation? The following research objectives will be addressed to answer this question:

1. What do local people consider as benefits from conservation?
2. Are incentives fairly dispersed to the appropriate beneficiaries?
3. Do local people perceive a direct link between their subsistence and conservation?
4. Do disparities in the distribution of benefits generate animosity toward conservation authorities and conservation in general among the disadvantaged?
5. Do benefits based on direct linkages that are recognized by local people lead to positive attitudes?

Examining the first two questions will provide information on the identification of IBPs based on local perceptions of benefits, and will provide the basis for evaluating the protected area's ability to distribute benefits to individuals and regions most affected by conservation efforts. By addressing the following question (#3), the research will explore whether benefits act as conservation incentives or simply as development projects, and the remaining questions will identify the effect of incentives or benefits on local attitudes. The complete examination of these five research questions will contribute to the understanding of the strengths and weaknesses of IBPs as identified in the literature.

1.3 Thesis Structure

This thesis is divided into seven chapters. Chapter 1 provides the rationale and outline of the research objectives. The limitations of IBPs to make meaningful contributions to conservation are explored in Chapter 2, based on discussions in the literature. Chapter 3 looks specifically at Nepal, outlining the social, ecological, economic, and political context of the research, and elaborating on national conservation initiatives and protected areas. The chapter also provides detailed characteristics of the study sites, Royal Chitwan National Park and Annapurna Conservation Area.

The methodology and data analysis methods are detailed in Chapter 4. Chapters 5 and 6 present the results and provide discussions of the findings. The benefits and costs identified by respondents are presented in Chapter 5. Later in the chapter, costs are compared to perceptions of benefits to understand the appropriateness of benefit distribution. Chapter 6 examines the connection between conservation and the benefits extended by IBPs, and their effect on attitudes. The final section, Chapter 7, summarizes the findings discussed in previous chapters and considers the limitations of IBPs as applied in protected areas in Nepal.

Chapter 2: Conceptualizing Incentive-Based Conservation¹

Conserving biodiversity is especially difficult in developing countries, where the majority of the world's biological resources exists and faces increasing pressure from subsistence-based human populations. In the years following the development of the Convention on Biological Diversity (CBD)², the approach to conservation in developing countries has changed with the recognition that communities nearby or within protected areas can receive social and economic benefits through the protection of biodiversity (Brechin et al. 2003). Such benefits not only improve the livelihoods of communities and provide some compensation for the costs resulting from conservation, but can also strengthen conservation efforts by acting as incentives to generate a local commitment to conservation objectives. In protected areas throughout the world, governments, donors, and resident people promote such incentive-based programs (IBPs) as a means to simultaneously achieve conservation and development goals. For IBPs to be effective, benefits must be “directly targeted and highly linked to the conservation objectives” (Brandon 2002: 445). However, due to several problems in their design, implementation, and management, IBPs have not realized their full potential (Songorwa 1999; Gupte 2003; Hutton and Leader-Williams 2003), and these problems have yet to be successfully addressed (Alpert 1996; Terborgh 1999). A common fundamental fault of IBPs is the inequitable and unfair distribution of benefits. At the same time, the actual contribution

¹ Portions of this chapter have been published in Spiteri, A. and S. Nepal. 2006. Incentive-Based Conservation Programs in Developing Countries: A Review of Some Key Issues and Suggestions for Improvements. *Environmental Management* 37: 1-14.

² The CBD was signed by more than 150 international governments at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, Brazil. The CBD was the first international agreement on the conservation and sustainable use of biodiversity.

of IBPs to conservation is under debate due to concerns over the ambiguous links between benefits and conservation (Gadd 2005). If the future of global biodiversity depends on the successful implementation of IBPs as a means of integrating conservation and human needs, then the strengths and limitations of IBPs and the conditions under which IBPs work best at producing conservation returns must be evaluated and understood.

2.1 Incentive-based Conservation

The push for local support for conservation strategies has led to the creation of numerous new approaches that can be summarized in two specific categories – community-based conservation (CBC) (Western and Wright 1994) and integrated conservation and development programs (ICDP) (Brandon and Wells 1992). Although these approaches share common characteristics, the key difference rests in the focus (Murphree 1994; Schelhas and Shaw 1995; Newmark and Hough 2000). CBC empowers local people in the management process, through partnerships in planning and the implementation of conservation projects, in the hopes of creating accountability and ownership of conservation objectives. ICDPs, on the other hand, focus on generating incentives for community support by providing opportunities for social and economic development. ICDPs do include levels of shared decision-making; however, as development is offered in return for conservation support, involvement in decision-making tends to be limited to consultation rather than partnerships (Newmark and Hough 2000). The best possibilities for successful conservation combine the strengths of ICDPs with the empowerment of CBC, and, for simplicity will be referred to as incentive-based programs (IBPs). Although incentives can also be negative in the form of penalties

(Hutton and Leader-Williams 2003), this discussion focuses on the positive incentives of IBPs – benefits. IBPs can include a range of benefits such as direct and indirect employment, tourism development and promotion, maintenance of natural resources for controlled present or future use, ecological services, improved social services such as health care and education, compensation payments, agricultural yield improvements through technology, agroforestry, and revenue sharing (Munro 1995; Tisdell 1999). IBPs are not a panacea for resolving all conflicts between conservation and people in protected areas throughout the world, but when equity and fairness in benefit extension are achieved and benefits are clearly linked to biodiversity conservation, IBPs are a valuable component in the conservation matrix.

In recognition of the limitations of classic exclusionary attempts to conserve biodiversity, most protected areas now incorporate IBPs as a way of encouraging local support. This has involved various combinations of traditional community natural resource management with government or non-government involvement, and has led to the creation of the biosphere reserve concept (Brandon 1998b; Gbadegesin and Ayileka 2000). Biosphere reserves are multi-purpose, in that they allow for residency and resource use within reserve boundaries, but use zoning as a tool to manage levels and types of resource use for conservation purposes (Brandon 1998b). National parks have also followed suit through extension efforts outside park boundaries in designated buffer zones to address local needs and gain community support for restricting use inside parks (Noss et al. 1999).

In recent years, the limitations of core / buffer zones and biosphere reserves have become more apparent in terms of their ability to simultaneously support local needs and

conservation, and, as a result, IBPs have gained considerable attention in the literature (Wainwright and Wehrmeyer 1998; Newmark and Hough 2000; Abbot et al. 2001; Zimmerman et al. 2001; Hutton and Leader-Williams 2003). Evaluations of IBPs have revealed limitations in reconciling the challenges of achieving meaningful conservation and providing livelihood opportunities and benefits to those most affected by conservation efforts (Gbadegesin and Ayileka 2000; Newmark and Hough 2000). Conservation initiatives without fair and equitable benefits will simply lead to a tragedy of the commons state which makes conservation objectives impossible to achieve (Ostrom 1990). Some authors have rejected the idea that conservation and development are compatible (Noss et al. 1999; Soulé and Terborgh 1999; Newmark and Hough 2000; Terborgh 2000; Gezon 2003). The fundamental barrier to the integration of conservation and development rests in their differing spatial scales required for success (Ferraro and Kiss 2002; Dolšák and Ostrom 2003). While development projects are most successful when implemented in small, well-defined regions, conservation efforts typically require applications across large spatial scales, transcending local, regional, and even national boundaries. Hackel (1998) suggests that IBPs which are successful in the short term will reach roadblocks in the future when people are no longer satisfied with the level of benefits provided. Challenges for incentive-based conservation initiatives also center on pressures from technology, population growth and global market economies (Hardin 1968; Alvard 1993; Hackel 1998; Terborgh 2000; Brandon 2002; Dolšák and Ostrom 2003; Goeires 2003). Terborgh (2000), a vocal proponent of exclusionary parks, acknowledges the ability of indigenous people to live sustainably when modern technologies and influences are not introduced. However, he argues that while Western

aid to developing countries continues to consist of “medicine before birth control...sustainable development in the face of continued population growth is an oxymoron” (Terborgh 2000: 1359). More recently, an alternative use of conservation budgets has been discussed, where funds available for IBPs would instead be used to issue direct payments for ecological services (Ferraro and Kiss 2002; Kiss 2004). Supporters of conservation payment incentives suggest the approach is no less sustainable than current IBPs, and avoids the complexity of addressing spatial and temporal threats to biodiversity, and struggling with designing and distributing indirect and ambiguous incentives under current IBPs (Ferraro and Kiss 2002; Kiss 2004). While such arguments are valid, an IBP able to target the appropriate beneficiaries with incentives directly tied to conservation has the potential to be self-sustaining in the long run and warrants continued research into conditions for success and explanations for failures (Bookbinder et al. 1998).

2.2 Barriers Inhibiting Incentive-based Conservation Programs

Generating uniform community support has been a fundamental challenge for IBPs, primarily due to deficiencies in the design, implementation, and distribution of benefits, and weak linkages between benefits and biodiversity conservation. Literature on IBPs has indicated attitudes toward conservation depend on a multiplicity of socio-demographic variables, including age, gender, ethnicity, and economic class; conservation awareness and education; participation; costs and benefits from conservation; relationship with conservation authorities; history of community-based conservation; and the length of the program’s existence (Table 2.1). As the predictors in Table 2.1 illustrate, the ability of IBPs to manifest in positive conservation attitudes

Table 2.1: Summary of research on conservation attitudes

Parameter	Predictors of Attitudes or Behaviors	Case Study
Demographics	<ul style="list-style-type: none"> Men typically more likely to support conservation than women Membership in a specific ethnic group Age group of residents Size of landholding Economic status 	Machalilla National Park, Ecuador (Fiallo and Jacobson 1995); Royal Chitwan National Park (Nepal and Weber 1995); Makalu-Barun Conservation Area, Nepal (Mehta and Kellert 1998; Mehta and Heinen 2001); Selous Game Reserve, Tanzania (Gillingham and Lee 1999); Ghodaghodi Lake, Nepal (Sah and Heinen 2001); Annapurna Conservation Area (Mehta and Heinen 2001); Osa Peninsula, Costa Rica (Stem et al. 2003)
Education and awareness	<ul style="list-style-type: none"> Education and knowledge of conservation issues and management goals Level of formal education Type and frequency of opportunities to participate in training activities 	Machalilla National Park, Ecuador (Fiallo and Jacobson 1995); Ghodaghodi Lake, Nepal (Sah and Heinen 2001); Annapurna Conservation Area (Mehta and Heinen 2001); Makalu-Barun Conservation Area, Nepal (Mehta and Heinen 2001)
Participation	<ul style="list-style-type: none"> Involvement in village government committees Active participation in conservation activities including involvement in village development committees Tourism revenue-sharing Local leadership Consideration of local livelihood needs 	Machalilla National Park, Ecuador (Fiallo and Jacobson 1995); Selous Game Reserve, Tanzania (Gillingham and Lee 1999); Ghodaghodi Lake, Nepal (Sah and Heinen 2001); Bamenda Highlands, Cameroon (Abbot et al. 2001); Annapurna Conservation Area (Mehta and Heinen 2001); Makalu-Barun Conservation Area, Nepal (Mehta and Heinen 2001); Bwindi Impenetrable, Mgahinga Gorilla, and Kibale National Parks, Uganda (Archabald and Naughton Treves 2001)
Costs from conservation	<ul style="list-style-type: none"> Level of dependency on natural resources Extent of threats to livelihoods from wildlife Impact on land (e.g., loss of land) and land values 	Maputo Elephant Reserve, Mozambique (de Boer and Baquete 1998), Selous Game Reserve, Tanzania (Gillingham and Lee 1999; Songorwa 1999) Ghodaghodi Lake, Nepal (Sah and Heinen 2001); Bamenda Highlands, Cameroon (Abbot et al. 2001); Makalu-Barun Conservation Area, Nepal (Mehta and Heinen 2001)
Benefits	<ul style="list-style-type: none"> Perceived or real, direct or indirect benefits Perceived level of economic benefits Type and extent of noncash benefits (empowerment, infrastructure) Level of project influence on resource availability for local residents Level of discrepancy in benefits between those who receive benefits and those who do not even within the same village Strength of linkages between tourism and community development Inclusions or not of marginal and minority populations 	Machalilla National Park, Ecuador (Fiallo and Jacobson 1995); Maputo Elephant Reserve, Mozambique (de Boer and Baquete 1998), Makalu-Barun Conservation Area, Nepal (Mehta and Kellert 1998, Mehta and Heinen 2001); Selous Game Reserve, Tanzania (Gillingham and Lee 1999, Songorwa 1999); Bwindi Impenetrable Forest, Uganda (Hamilton et al. 2000), Bamenda Highlands, Cameroon (Abbot et al. 2001); Annapurna Conservation Area (Mehta and Heinen 2001); Komodo National Park, Indonesia (Walpole and Goodwin 2001); Bwindi Impenetrable, Mgahinga Gorilla, and Kibale National Parks, Uganda (Archabald and Naughton Treves 2001); Shimentai Nature Reserve (Jim and Xu 2002); Osa Peninsula, Costa Rica (Stem et al. 2003), Waza National Park, Cameroon (Bauer 2003)

Continued

Table 2.1: Continued

Parameter	Predictors of Attitudes or Behaviors	Case Study
Relationship with conservation authorities	<ul style="list-style-type: none"> Relationship between conservation authorities and residents Type and level of technical or financial support extended to residents Frequency of direct interaction between conservation authorities and residents 	Machalilla National Park, Ecuador (Fiallo and Jacobson 1995); Hwange National Park, Zimbabwe (McIvor 1997), Bwindi Impenetrable, Mgahinga Gorilla, and Kibale National Parks, Uganda (Archabald and Naughton Treves 2001)
Proximity to protected area boundary	<ul style="list-style-type: none"> Distance between community and conservation authority offices Distance from village to protected area Frequency of residents' visits to protected area Village location in protected area or outside protected area 	Royal Chitwan National Park (Nepal and Weber 1995); Komodo National Park, Indonesia (Walpole and Goodwin 2000), Bamenda Highlands, Cameroon (Abbot et al. 2001); Shimentai Nature Reserve (Jim and Xu 2002)
Community conservation, length of program existence	<ul style="list-style-type: none"> History of community-initiated conservation efforts Number of years of project implementation Stage of project (attitudes during the early stages of a program might be positive due to uncontested expectations of benefits) 	Nanda Devi Bioshpere Reserve, India (Maikhuri et al. 2001); Bamenda Highlands, Cameroon (Abbot et al. 2001); Annapurna Conservation Area (Mehta and Heinen 2001); Makalu-Barun Conservation Area, Nepal (Mehta and Heinen 2001); Komodo National Park, Indonesia (Walpole and Goodwin 2001); Shimentai Nature Reserve (Jim and Xu 2002)

Source: Adapted from Spiteri and Nepal (2006).

varies substantially based on site specific socio-demographic variables; therefore, IBPs must ensure benefits are distributed to account for such heterogeneity and diversity of interests in target communities (Bauer 2003). The premise behind IBPs is to encourage residents and resource users of biosphere reserves and buffer zones to “voluntarily adopt beneficial uses and avoid harmful ones” (Groom et al. 1999: 189). For the benefits extended by IBPs to truly create such positive incentives for conservation, benefits must also be directly linked to the state of natural resources. When such linkages are absent, communities continue to feel entitled to benefits even when conservation objectives are not achieved (Kiss 2004), and IBPs may be unable to support conservation. Without direct linkages, IBPs will only improve attitudes toward conservation so long as sufficient levels of benefit continue to be provided (Struhsaker 2002). Given the success of IBPs depends on the equal and fair distribution of benefits designed with a clear dependency on conservation objectives, these two issues are the main focus of the discussion below.

2.2.1 Delivering Benefits

Before discussing the distribution of benefits by IBPs, it is important to clarify the use of the terms fairness and equity in this paper. Equity refers to the inclusion of all members of a community regardless of demographic variables, and all villages under the jurisdiction of the IBP. For example, an IBP extending benefits only to men would be considered to have an unequal representation of, or consideration for, women. Fair distribution of benefits does not require all members of a community or every individual community to benefit equally, but for benefits to be distributed with consideration for an individual's or community's level of costs as a result of the protected area (Metcalf

1994; Brandon 1998b; Honey 1999). While equity concerns the distribution of benefits based on demographic variables, fairness refers to distribution relating to costs.

A primary limitation to the effective application of conservation incentives is actually defining the boundaries of *community*. Classifications of community are typically flawed due to inaccurate assumptions of homogeneity in social, political, economic and spiritual values and narrow consideration for who should be considered beneficiaries of development programs (Agrawal and Gibson 1999; Leach et al. 1999; Brown 2002); when, in fact, rural communities in developing countries are comprised of individuals representing a multiplicity of values, beliefs and ideals (Alcorn 1993; Redford and Stearman 1993; Agrawal and Gibson 1999; Leach et al. 1999; Archabald and Naughton-Treves 2001; Kapoor 2001; Mehta and Heinen 2001; Salafsky et al. 2001; Hammersley Chambers and Beckley 2003). Ignoring the differences between individuals in a community inhibits the success of IBPs by narrowing the definition of target beneficiaries. Program benefits and compensation based on homogeneity will not be suited to satisfy the needs of everyone in the community and will foster resentment among those excluded. Programs based on a range of benefits that target the diverse needs in the community will enhance the equity in the dispersion of compensation, and be best positioned to encourage positive conservation attitudes among locals (Archabald and Naughton-Treves 2001).

The limited scope used by many IBPs for defining *community* can exclude members of the affected population, leading to the unfair and unequal distribution of benefits. Disparities in the distribution of benefits can occur on three spatial scales: (1) local (Mehta and Kellert 1998; Gillingham and Lee 1999; Songorwa 1999; Archabald and

Naughton-Treves 2001; Mehta and Heinen 2001; Walpole and Goodwin 2001); (2) regional (Nepal and Weber 1995; Abbot et al. 2001; Jim and Xu 2002; Sekhar 2003); and (3) national and international (Tisdell 1999; Walpole and Goodwin 2001; Balmford and Whitten 2003). To maximize an IBP's ability to contribute to conservation through development, benefits must be designed and dispersed in a manner to ensure the local costs of conservation are offset with compensation.

Ideal applications of IBPs direct benefits to those most affected by conservation (Tisdell 1999). The costs tend to be borne by the poorest of the poor and manifest in restrictions on access to resources needed for subsistence, and damages to crops and livestock by protected wild animals (Shyamsundar and Kramer 1996; Colchester 1997; Tisdell 1999; Karanth and Madhusudan 2002). Although resource restrictions and threats from protected wildlife affect households within communities to varying degrees, the benefits from IBPs are normally not distributed to account for such differences (Abbot et al. 2001; Archabald and Naughton-Treves 2001; Barrett et al. 2001; Adams and Infield 2003). Research into community attitudes in the Bamenda Highlands, Cameroon found benefit programs were not specifically targeted to compensate those who had lost land during the creation of the park (Abbot et al. 2001). Those who had experienced substantial hardships perceived the distribution of benefits as unfair, and remain unsatisfied with development programs. Similar results were found in a study of IBPs in Kanchenjunga Conservation Area, Nepal. Pastoralists were found to suffer the most consequences as a result of livestock depredation by protected snow leopards (*Uncia uncia*); however, the benefits extended by the IBP, including female empowerment, education for children, cultural conservation, tourism development, training in gardening,

accounting and sewing, were not recognized by households engaged in pastoralism (Ikeda 2004). For benefits to yield any meaningful contribution to conservation, benefits must be received and recognized at the local level by those most affected by conservation efforts in their community (Honey 1999; Tisdell 1999).

Poorly designed benefit programs tend to reinforce existing class structures, favouring the elite and not addressing the needs of the lower class residents most affected by conservation. Tourism is often used as a tool to generate benefits for communities, but few locals find jobs in tourism as they lack the skills and education, and the high-paying management jobs are usually given to outsiders or elite immigrants (McIvor 1997; Tisdell 1999; Walpole and Goodwin 2000, Sekhar, 2003 #246). In three national parks in western Uganda, Archabald and Naughton-Treves (2001) found benefit options provided unsuitable compensation for lower class residents. Although local attitudes had improved due to a tourism revenue-sharing program, some people were unable to benefit from the social programs instituted by the project. Revenues were directed towards the construction of a community school, but children of rural residents suffering most from crop raiding were occupied as crop guards and had no time available for education. Similar shortfalls in IBPs have been identified in Selous Game Reserve in Tanzania, where government funding for entrepreneurial projects is restricted to residents able to procure fifty percent of the funds required for development (Songorwa 1999). Development projects are typically limited to the elite who, in many cases, are motivated little by conservation benefits aimed at improving livelihood options (Brandon 1998b). If benefit distribution is not distinguished based on individual compliance or contribution to conservation objectives, IBPs can offer little incentive for community conservation (Van

Schaik and Rijksen 2002). Wainwright and Wehrmeyer (1998) identify this limitation in Luangwa, Zambia where poachers continue to receive identical benefits as others in the community despite their disregard for restrictions on resource exploitation. Similarly, in Qwaqwa National Park, South Africa, local residents who refused to comply with park restrictions limiting livestock herd size were the same residents benefiting from employment opportunities offered by the park (Slater 2002). In such situations, those who break the rules benefit, while those who abide by protected area restrictions are the disadvantaged (Ostrom 1990; Slater 2002; Van Schaik and Rijksen 2002). IBPs developed with the interests of the appropriate target beneficiaries in mind will be most likely to lead to good relationships with conservation authorities and corresponding positive attitudes toward conservation in general.

At the community level, many IBPs are not specifically designed with attention to the suitability of benefits to the lives and needs of landless squatters or pastoralists. IBPs focused on landholding improvements, such as biogas construction, fencing or toilets, and requiring funding contribution on the part of a resident, provide little benefit to landless residents who have no permanent interest in the improvements to land which they do not own. Also, because some projects are directed to those who keep livestock (i.e., biogas, wildlife mitigation fences), the poor are inadvertently excluded from such benefits due to the economic costs associated with raising livestock. Providing alternatives which act as incentives for landless residents to contribute to conservation objectives is essential as "inequities in the distribution of rights to arable lands may spur migration into ecologically fragile areas rich in biodiversity, especially when landless farmers have no alternative but to migrate into fragile forest areas" (Lynch and Alcorn

1994: 389). In the case of Amboseli National Park in Kenya, benefits from a tourism-revenue sharing program were not suited to the pastoral lifestyles of the Maasai people, who moved their livestock according to the seasons (Western 1994a). Revenues were used to improve social services, such as building schools and hospitals, which required the Maasai to adopt a sedentary lifestyle and encouraged private ownership of land. Maasai who continued as pastoralists had less arable land available for livestock use during drought times due to private land ownership and were unable to benefit from revenue-sharing. Such an IBP does little to encourage behaviours compatible with conservation among the excluded, but creates more animosity towards conservation and restrictions on access to land and resources.

A successful IBP that provides fair and sufficient benefits for local residents to support conservation efforts can, in fact, be counterproductive in encouraging immigration through the attraction of benefits (Hart 2002; Newmark, 2000 #102; Struhsaker 2002; Tutin 2002; Gezon 2003). Distinguishing and differentiating between long term residents and recent immigrants can be difficult. On the one hand, including recent immigrants in benefit dispersal can reduce the amount of benefits available to individuals below the level required to generate adequate compensation and conservation incentive, yet the exclusion of new immigrants from benefits may create a high dependency on natural resources and compromise conservation efforts (Davenport et al. 2002; Fortwangler 2003). Ultimately, immigration places increased pressure on protected resources and needs to be discouraged (Van Schaik and Rijksen 2002). Some suggest encouraging migration away from protected areas by creating incentives and development projects elsewhere (Schelhas and Shaw 1995; Brandon 1998b; Slater 2002).

Immigration rules and limitations have been introduced to the Galápagos Islands National Park, Ecuador, to address such tourism-invoked migration and halt the adverse social and ecological effects of the 6 – 10% per annum population growth on the islands (Honey 1999). The effects of migration to an environmentally sensitive area extend beyond the complications associated with increased human populations. With a lack of an ancestral history of dependence on the land for subsistence and the corresponding knowledge passed from generations or learned as children from conservation educational efforts, the depletion of surrounding natural resources by migrants for their benefit in the present comes with little hesitation (Honey 1999; Van Schaik and Rijksen 2002). Distributing benefits based on need, cost, compliance and residency is difficult but necessary to ensure equitable and fair distribution of conservation and development perks (Adams and Infield 2003).

Participation in IBPs is essential if benefits are to adequately address local needs and offer realistic alternatives for livelihood activities that are compatible with existing community structures (Fiallo and Jacobson 1995; Gbadegesin and Ayileka 2000; Kapoor 2001). Although progress has been made in including local people in the planning of IBPs, opportunities for partnerships and active participation have not been extended to the end-users of natural resources (Heinen and Mehta 1999; Kellert et al. 2000). Existing economic class structures continue to limit the involvement of the poor (Timsina 2003) or ethnic minorities (Mehta and Heinen 2001) and programs that have successfully mobilized the local poor continue to discriminate based on gender, thereby excluding women, the primary users of natural resources, from conservation planning and decision-making (Mehta and Kellert 1998; Wainwright and Wehrmeyer 1998; Kapoor 2001;

Mehta and Heinen 2001; Mahanty and Russell 2002). A community forestry project in Nepal examined by Timsina (2003) has attempted to overcome this limitation by requiring a one-third female representation in forestry committees and encouraging the participation of rural poor. However, a lack of genuine empowerment of these members of the community continues due to existing social barriers – true power continues to rest with the elite. At meetings, the elite represent the main voice and their suggestions often become policy to the detriment of the poorer people. Heralded as an exemplary model of community participation, even the Annapurna Conservation Area Project in Nepal suffers from the above-mentioned problem (Nepal et al. 2002). For benefits to act as incentives that generate extensive community support, the IBPs must actively involve marginalized residents in the planning phase.

Disparities in the distribution of IBP benefits are also encountered on a regional scale between communities bordering or located within protected areas. Research conducted on the spatial distribution of benefits between villages includes a survey by Mehta and Heinen (2001) into the effects proximity to Annapurna and Makalu Barun Conservation Areas in Nepal has on local attitudes toward conservation. In both projects, residents closest to the protected area held less favorable attitudes than those further away. Similar findings have been reported by another study in Royal Chitwan National Park, Nepal (Nepal and Weber 1993, 1995). Similarly, in a survey conducted by Jim and Xu (2002) on local perceptions of Shimentai Nature Reserve in South China, people residing far from the nature reserve supported the project, while those nearby did not. The variation between villagers' perceptions can be attributed to spatial discrepancies in the level of expected benefits and differences in the degree of impacts experienced from conservation

restrictions. In the case of Shimentai Nature Reserve, nearby residents expected greater economic benefits from the creation of the reserve than what they actually received, and were unprepared for the corresponding high negative impacts on their livelihood (Jim and Xu 2002). Residents further from the reserve boundaries experienced less negative consequences, yet still received expected benefits, such as reliable water supply and development opportunities, from its creation. Walpole and Goodwin (2000) examined the distribution of benefits from tourism between villages within the Komodo National Park, Indonesia, who suffered the most costs associated with conservation, and tourism gateway villages located outside the park. Their study found only 7% of tourism-related employment was generated in villages in the park, and, hence, tourism did not provide sufficient benefits to support conservation among those experiencing the most costs. Another study by Sekhar (2003) in Sariska Tiger Reserve, India, illustrates the shortfalls of tourism as a uniform provider of compensation and benefits, as support for conservation was contingent on the proximity to tourism zones.

Compensation programs that do not consider differences in community costs of conservation in the provision and focus of benefit programs do not maximize the opportunity to create incentives among those most likely to be affected by and affect biodiversity conservation efforts. Consequently, these disadvantaged groups may consciously choose to disregard imposed restrictions, compromising the realization of conservation objectives due to their limited return from community benefit programs. In situations where individual villages experience similar costs from conservation, the ability of IBPs to replicate benefit programs, such as tourism promotion, in all affected locations may be limited, and, as a result, the livelihood needs of some communities may

not be addressed (Sekhar 2003). Further research is needed into the differences in attitudes between communities that face similar implications from conservation, but receive varying levels of benefit.

Disparities not only in the distribution of benefits, but also in the distribution of costs, can also exist on a national and international level. The opportunity costs of conservation, including changes in resource use and losses from protected wildlife, are felt most by local residents depending on natural resources for subsistence; however, few benefits actually reach individuals at the local level (Balmford and Whitten 2003). In many cases, benefits intended for the local community may instead be received by external elites (Fiallo and Jacobson 1995; Walpole and Goodwin 2001). Tourism is commonly promoted as a conservation benefit; however, the benefits from tourism are mostly felt on a national and international level (Tisdell 1999). In many cases the largest portion of tourism expenditures is spent within the traveler's own country in terms of airfare and travel agent packages (Nepal 2000). In addition, tourists depend on a number of goods not locally available; therefore, much revenue is lost to the import of commodity items produced elsewhere (Walpole and Goodwin 2000). Fiallo and Jacobson (1995) found the jobs and trade activities from tourism to be the primary benefit from Machalilla National Park in Ecuador; however, the main beneficiaries were residents of communities outside the park boundaries. Those living within the national park were most negatively affected by restrictions on natural resource use and were most likely to engage in activities detrimental to conservation objectives, yet received few corresponding benefits from tourism. Similarly, Walpole and Goodwin (2001) found non-residents benefited most from the creation of Komodo National Park. In Komodo

National Park only 1% of direct tourism revenue is received by residents living within the park, and only 20% is retained within the area surrounding the park (Walpole and Goodwin 2000).

Another possible leakage of community compensation can result from the attraction provided by benefit programs to developers from other areas in search of employment or business opportunities (Newmark and Hough 2000; Sekhar 2003). With a lack of locally available capital, wealthy developers from urban areas or other countries can invest in the type of infrastructure or service developments demanded by travelers and capitalize on the promotion of a protected area as a tourist destination. With economic globalization and current international free-trade regulations, the monopolization of conservation benefits by outside financial investors presents a real threat to the potential of tourism to provide incentives for support at the local level. In Costa Rica, the General Agreement in Trade in Services allows for 100% foreign investment in tourism services by signatory countries, making the delivery of tourism benefits to local communities an even more difficult task (Honey 1999). External beneficiaries have limited ties to the land and, therefore, less to lose from the implications of degrading natural resources. For example, a guide from an urban area will be more likely to uproot trees on steep mountain slopes to make a fire for his clients than a local guide concerned with the potential loss of farmland from erosion associated with deforestation.

Biodiversity conservation not only provides employment and business opportunities to national migrants, but also creates a sense of pride for the entire country as it becomes internationally recognized for its rich natural resources. It has been suggested that the greatest benefits derived from conservation efforts in developing countries center in

ecological services such as carbon sequestering, and non-use values including “those arising from retaining the possibility of use in the future (option values), those that describe the value of simply knowing a habitat or species is still extant (existence values), and those that derive from being able to pass on those benefits to future generations (bequest values)” (Balmford and Whitten 2003: 243). Although the national community benefits from these services and values, the international community is the primary beneficiary.

Conservation initiatives based on inaccurate assumptions and incomplete considerations of community are not likely to succeed in creating sufficient incentives for conservation among residents. Benefit programs that acknowledge the heterogeneous needs of communities and account for inequities in the distribution of benefits at the local, regional and national and international levels are best able to generate local commitment to conserving natural resources among those most affected by limitations on its use. Furthermore, the consequences of limited considerations of community are not restricted to the distribution of benefits – the exclusion of entire groups from the planning and design process can inhibit the abilities of benefits to actually address local needs. To date, IBPs have not adequately addressed the leakage of benefits to external elites or immigrants. In the future, residency requirements need to be incorporated into compensation programs to maximize the local retention of conservation benefits. Simply increasing development activities, such as tourism, will not lead to a substantial increase in revenue at the local level unless deficiencies in benefit dispersion are addressed. On

the other hand, some consideration, and possibly compensation, for the effects of conservation on external stakeholders may be necessary given their ability to impact the state of the environment (Brown 2002).

2.2.2 Creating Incentives

Although well-designed benefits that address local needs and costs can generate positive perceptions of conservation projects, for IBPs to truly act as incentives and have a lasting positive effect on attitudes, benefits must be directly linked to the persistence and integrity of natural resources and local people must recognize this link (Wells and Brandon 1993; Noss et al. 1999; Salafsky and Wollenberg 2000; Brown 2002; Ferraro and Kiss 2002; Gadd 2005). As suggested by Hutton and Leader-Williams (2003), a perceived or real crisis in the availability of natural resources necessary for subsistence seems to be a precursor to local support for conservation. When the survival of a species does not affect the livelihood needs of indigenous people, local support is difficult (Gbadegesin and Ayileka 2000; Gadd 2005). Creating a direct link between the survival of a species and the livelihood needs of residents is critical in initiating local conservation efforts and should be one of the bases for creating IBPs (Salafsky and Wollenberg 2000:1425). IBPs that are able to establish such direct linkages are better positioned to achieve conservation goals, as “livelihoods drive conservation rather than simply being compatible” (Salafsky and Wollenberg 2000:1425).

Salafsky and Wollenberg (2000) identify a framework for understanding the diverse linkages between conservation and development. Conservation programs are classified in three categories describing the integration of social and economic needs with biodiversity: no linkage, indirect linkage and direct linkage (Salafsky and Wollenberg

2000:1425). No linkage between conservation and development is common in the traditional application of classic exclusionary approaches to conservation. Projects based on indirect linkages between local needs and environmental protection are intended to generate support for conservation projects by offsetting corresponding losses. Incentives based on indirect linkages tend to be communal and include health care, school construction, and other infrastructure development. However, communal benefits provide little incentive to the individual, and, unless a community is homogeneous, are unlikely to meet the needs of all residents impacted by conservation efforts. Despite the intent, these types of programs offer only short term solutions and are not self-sustaining in that they require ongoing financial investment and enforcement (Western 1994a; Barrett and Arcese 1995). Benefits based on indirect linkages may lead to further and more substantial environmental consequences in the future resulting from the potential incompatibility of benefits with conservation objectives (i.e., road construction) and an influx of migrants attracted by the heightened social development of the area (Brown 2002; Hart 2002; Tanner 2003). Further, IBPs may actually provide beneficiaries with the means and increased desire to exploit resources and participate in commercial extraction (Ferraro 2001; Van Schaik and Rijksen 2002). When benefits are based on indirect linkages, conservation support is bought in exchange for local development (Barborak 1995). When local development needs are not met or more benefits are desired, residents may engage in activities detrimental to conservation until demands and expectations are reached (Wells and Brandon 1993; Barrett and Arcese 1995; McIvor

1997; Struhsaker 2002; Kiss 2004). Such circumstances create a scenario where IBPs simply become perceived by local people as development projects with conservation held as collateral (Struhsaker 2002).

Conservation programs that establish a direct dependency on the preservation of biodiversity for livelihood practices are best positioned to achieve economic, social and ecological objectives in the long run (Brown 2002). Under directly linked IBPs, benefits result from conservation, and future provisions of benefits are available only if the resources continue to be protected. Ideally, such programs result in community-led sanctions on local and external threats to biodiversity, and require minimal formal enforcement (Ostrom 1990). Examples of such programs include tourism development, limited harvesting of natural resources, and community forestry. Although direct linkages are most desirable and can make the greatest contribution to conservation, benefits based on such linkages can be difficult to achieve (McIvor 1997).

Tourism holds the most promise as a directly linked benefit (Salafsky and Wollenberg 2000), yet linkages can only be established if biodiversity is the main tourist attraction (Damania and Hatch 2005). For example, tourism in Bwindi Impenetrable Forest, Uganda, is based on the opportunity to view endangered mountain gorillas; therefore, the distribution of revenues to surrounding communities has created an incentive to protect the remaining forest as local people recognize the continued provision of benefits depend on the survival of the gorilla (Hamilton et al. 2000). In areas where tourism is not dependent on biodiversity, establishing direct linkages is unlikely (Gadd 2005). The opportunities to directly benefit from tourism are also limited by market potential, village proximity to tourist destinations, and an individual's ability to procure funds to develop

tourism enterprises (Bookbinder et al. 1998; Wright and Andriamihaja 2002; Sekhar 2003; Kiss 2004; Gadd 2005). For the majority of local people, the benefits extended by tourism are indirect, as IBPs use tourism revenue to fund community development projects. These benefits can be perceived as directly tied to conservation if local people recognize project funding derives from tourism to the protected area. Education and awareness efforts can bolster local recognition of a link from indirect tourism benefits (Krüger 2005).

IBPs often fail to generate incentives for conservation support due to an inability to create a dependency between benefits and conservation. Although typical benefits initiated by conservation authorities have been classified here as either indirect or direct, direct linkages can become indirect if the incentives are not applied or distributed equally, do not adequately address local needs and costs, or if the linkage is unclear, ambiguous and not recognized by local people (McIvor 1997; Gadd 2005). Large scale developments, such as road construction, and increasing integration into the market economy lead to growing aspirations which can also weaken linkages (Western 1994a; Brown 2002). Without the recognition of a direct link, the benefits under IBPs are continually evaluated by recipients against the costs of conservation, and the ability of IBPs to manifest in conservation support depends on the program's continual provision of sufficient and measurable benefits (Ostrom 1990). Fostering local commitment to the conservation of biodiversity can best be enhanced by the fair and equitable provision of incentives directly linked to the continued existence and protection of natural resources.

2.3 Factors Further Confounding Success

As the discussion above illustrates, achieving equity and fairness in the distribution of directly linked benefits through IBPs is extremely difficult. Even if such conditions can be achieved in a given space or time, maintaining successful IBPs along time scales proves to be an even greater challenge: equity, fairness and linkage need to be considered “both within and between generations” (Brown 1997: 96). Uncertainties can create disincentives to conserve among local people, without the assurance of the continued future existence of resources for use or benefit to local residents (Ostrom 1990; Brandon 1998b).

There are many challenges to the long term provision of benefits by IBPs. The ability of development projects to continually provide economic benefits to a community are subject to fluctuations in market values and consumer preferences, limitations to funding, and the resilience of resources to the actual development (Salafsky et al. 1993; Wainwright and Wehrmeyer 1998; Newmark and Hough 2000; Adams and Infield 2003; Hutton and Leader-Williams 2003; Tanner 2003). Over the past two decades, many international conservation budgets have been directed towards the development of IBPs; however, funding of such programs tends to be for short-term periods (Spergel 2002). Funding limitations have not only led to high turnovers in staff and management, but have also led to rapid changes in the direction and design of IBPs. By their nature, IBPs require time to be accepted by local people and, therefore, to have an impact on local attitudes toward conservation (McIvor 1997). With the short funding terms of many international donor agencies, insufficient time is allowed for a project to make a contribution to conservation objectives. In addition, many projects are dependent on the

continued provision of funds from donor agencies, yet donor agencies do not work under such long term financing programs. With future funding sources so uncertain, establishing a sense of security among local people towards the future returns of conservation efforts today is difficult.

The economic shortsightedness of alternatives to traditional livelihood practices offered in return for support for conservation can lead to failures in IBPs. When IBPs depend on the economic and market conditions abroad, as is the case with tourism and exported agricultural and handicraft products, incentives can quickly disappear, creating an immediate threat to protected areas (Tisdell 1999; Adams and Infield 2003). Political turmoil within a country can also significantly reduce tourist arrivals and associated revenues, leading to a disruption in the funds available for IBPs (McIvor 1997; Gadd 2005). Some countries are trying to promote domestic tourism as a more stable alternative to international tourism (Lusigi 1995; Honey 1999; Davenport et al. 2002). Salafsky et al. (1993) illustrate how community reliance on seasonal, perishable, fragile and low market demand goods in Kalimantan, Indonesia leaves limited potential for economic independence. According to Salafsky et al. (1993: 43), “an ideal extractive system should be based on a mix of products whose availability and demand periods are staggered so as to sustain harvest activities throughout the year”. Based on an evaluation by Wainwright and Wehrmeyer (1998), the alternatives to resource-based subsistence activities offered in Luangwa Integrated Resource Development Project (LIRDP) in Zambia are also established on limited possibilities for economic stability. LIRDP attempts to promote conservation through revenue-sharing earned from big-game safaris. Wainwright and Wehrmeyer (1998) are critical of the approach and suggest the reliance

on such non-renewable resources as wildlife is not economically, nor ecologically sustainable given the region's projected population growth.

IBPs also face considerable threats in their longevity when faced with opposing government mandates for major developments (Brandon 1998b). A major development, such as a road or hydro project, can quickly weaken the link between conservation and IBPs, thereby inhibiting a program's ability to deliver benefits to local residents (Schelhas and Shaw 1995; Brandon 1998a; Dobson et al. 1999; Gautam et al. 2004a). Apart from encouraging migration, roads can bring the potential for enticing economic opportunities from the exploitation of resources. Designing incentives to compete with such strong economic incentives can be beyond the budget, resources and capabilities of most IBPs. The capability of IBPs to achieve long term ecological objectives depends on the ability of programs to provide continued economic benefits to local communities. Maintaining incentives throughout changes in funding, project turnover, season, market fluctuations and major developments present major challenges for IBPs in ensuring the equitable distribution of benefits to gain local support for conservation in the long term (Balmford and Whitten 2003).

2.4 Strengthening Incentive-based Conservation

The relationship between formal education and conservation attitudes has been widely identified in the conservation literature in developing countries (Fiallo and Jacobson 1995; Sah and Heinen 2001; Stoll-Kleemann and O'riordan 2002). All of these studies suggest that negative attitudes toward conservation agencies and conservation itself are in part the result of low levels of education. A lack of education can lead to local confusion and misunderstanding surrounding the purpose and intentions of

conservation projects, and the link between benefits and conservation (Krüger 2005). In addition to creating incentives based on accurate representations of community, IBPs must also communicate, through education and community outreach programs, how conservation can benefit local communities. Moreover, organizations need to ensure communication efforts are designed to reach the members of the community in most need of education and training (Jim and Xu 2002). Upon learning of the establishment of a nature reserve, residents of Shimentai Nature Reserve were more destructive towards the environment in fear of losing opportunities to profit from resources in the future, despite governmental intentions to consider local livelihood needs (Jim and Xu 2002). Such misunderstandings can be minimized through the effective targeting of educational efforts on project objectives to the desired audience. Barriers, such as literacy levels, class, gender, ethnicity and age, can inhibit the ability of communication efforts to reach a target audience. For education and training programs to reach the target population, IBPs need to be designed in consideration of these barriers and must be scheduled conveniently so that maximum participation can occur (Colfer et al. 1999). If people are not aware of the benefits, that their needs have been considered, or how the benefits are linked to the conservation of the flora and fauna, then the efforts of an IBP will go unnoticed and not be effective. In order to extend conservation awareness, participation in conservation awareness programs should be mandatory for outsiders directly or indirectly benefiting from protected areas through employment, business opportunities or resource extraction. Careful consideration of education and equality in the future provides an opportunity for solid improvements in the incentive-based approach, and subsequent achievements in the global effort to conserve biodiversity.

2.5 Conclusion

The ultimate goal of IBPs is to reduce conflicts between the social and economic needs of rural communities and the need to protect the environment. Current discourse on conservation management in developing countries suggests that participation and the provision of benefits are essential mechanisms to reduce conflict (Fiallo and Jacobson 1995). Despite the integration of IBPs into the conservation strategies of many developing countries, conflicts continue to persist due to problems with the implementation of programs, particularly due to inadequate consideration of local residents and their heterogeneity, and the limited connection between benefits and conservation (Wells and Brandon 1993; Noss et al. 1999; Kellert et al. 2000; Brandon 2002). For IBPs to effectively reduce conflict in the future, improvements need to be made to address the shortcomings experienced to date.

Recent challenges to the suitability of IBPs as a conservation alternative have created a need to evaluate existing applications of the approach. Research on incentive-based conservation to date has shown that the approach, in principle, favors the inclusion and participation of local communities' needs in designing linked conservation incentives. However, examples from many developing countries indicate that the ability of IBPs to make lasting contributions to conservation objectives has been restricted due to the inefficiencies in the design and implementation of benefits. Benefits hold different values for different people. Whether one is poor or rich, a farmer or a business person, lives inside or outside a protected area, or is a resident of a host country or another country, will determine if a benefit is actually perceived as a true benefit worthy of forgoing the social and economic opportunities from exploitation of a resource and

requiring a united community effort to protect the resources (Tisdell 1999). Designing benefits to fulfill the needs of all stakeholders of a conservation initiative is challenging, but ensuring the benefits actually reach the intended beneficiaries and are perceived to be linked to conservation has proven to be an even greater challenge in the global effort to conserve biodiversity.

Well-designed incentive programs that establish linkages between conservation and local subsistence based on local needs and costs can generate positive perceptions of conservation projects and lead to environmental stewardship into the future (Salafsky and Wollenberg 2000; Brown 2002; Michaelidou et al. 2002). Although several studies have evaluated the ability of IBPs to achieve community support for conservation, none have fully examined under what political situations and institutional frameworks local support and their participation can be truly realized. This knowledge gap warrants a comparative evaluation of IBPs as applied in core / buffer zones and biosphere reserves. This comparison will provide valuable insights on the potential and challenges of applying incentive-based conservation to a particular socio-economic situation. While many authors are quick to suggest a need to abandon the incentive-based approach for alternatives to biodiversity conservation, perhaps the best solution is to work on improving the shortcomings of current IBPs. Future research into the strengths and weaknesses of IBPs can also offer valuable insights on extending conservation efforts beyond the boundaries of strictly protected parks and reserves.

By focusing on evaluating the distribution of benefits and the perceived link established between conservation and benefits under IBPs in core / buffer zone and biosphere approaches, the research presented in the following chapters contributes to the

understanding of the successes and failures of IBPs in Nepal. To provide an accurate representation of a program's ability to establish incentives that generate community support among residents most affected by conservation, the research encompasses a comparison of local perceptions within communities receiving different levels of program benefits but experiencing similar consequences as a result of the protected area.

Chapter 3: Nepal – Background Information

3.1 Geographical Context

3.1.1 Location

Nepal is a small, landlocked country comprising 147 181 sq km, located on the southern slopes of the central Himalaya, and surrounded by countries with large human population densities. Nepal is divided into 75 districts within five large development regions: Eastern, Central, Western, Mid Western and Far Western. Each district is further divided into Village Development Committees (VDC) and Municipalities. In total, there are currently 3915 VDCs, with nine wards in each VDC.

3.1.2 Physiography

In less than 200 kilometres the elevation in Nepal changes from slightly above sea level (60 metres) to the top of the world's highest mountain, Mount Everest (8848 metres), creating a climate with extreme spatial and temporal variations in temperature and precipitation (HMGN/MFSC 2002). Nepal is divided into three main ecological zones: the lowlands (*terai*), the middle hills, and the mountains. Approximately 43% of the total land area is comprised of the mountain zone, another 43% of the middle hill zone, with the remaining 14% included in the lowlands of the *terai* (HMGN/MFSC 2002).

Terai

The *terai* zone, the southern portion of the country, includes areas under 300 metres. The *terai* was once a densely forested region, uninhabitable apart from indigenous residents, due to malaria-carrying mosquitoes (HMGN/MFSC 2002). In 1953, with the support of the United States Agency for International Development (USAID) and the World Health

Organization, the national government began malaria eradication efforts as part of a population redistribution program (Matthews et al. 2000; Nagendra et al. 2005; Heinen and Shrestha 2006). With the eradication of malaria, the terai region experienced rapid settlement and agricultural land development, contributing to extensive deforestation over the past fifty years. The fertile soil of the terai provides the best agricultural land in the country; as a result, the zone continues to receive an influx of migrants from the middle hill and mountain zones (NESAC 1998; Heinen and Shrestha 2006).

Middle Hills

Between 300 metres and 3000 metres, the middle hill physiographic zone includes two distinct sub zones: the Siwalik and the Mahabharat Lekh. The Siwalik, the southern portion of the middle hill zone, is comprised mostly of alluvial outwashes of gravel, stone, boulders and sand from the hills. Given its geological composition, water is not readily available, except during the monsoon. The region experiences extensive cultivation, and is susceptible to soil erosion. The Mahabharat Lekh lies above the Siwalik (areas over 15000 metres), and its geological composition consists of granite, limestone, or quartzite (HMGN/MFSC 2002). The northern portion of the Mahabharat Lekh includes the high valleys of Nepal, such as Kathmandu, with very high human population densities. A substantial portion of the region is terraced for cultivation from the valley floors up to the hill tops, with substantial corresponding rates of deforestation and soil erosion (HMGN/MFSC 2002).

Mountains

Areas over 3000 metres, the mountain physiographic zone, encompass the southern portion of the Himalayan range. The Himalaya is the youngest and highest mountain range on earth. With only 4% of the land suitable for cultivation, the mountains have the lowest

human population densities in Nepal (HMGN/CBS 2003). Summer grazing pastures are found at lower elevations, and altitudes over 5500 metres are comprised of only rock and ice.

3.1.3 Climate

The varied climate in Nepal is a direct result of variances in altitude, and differs in each physiographic zone. On average, Nepal receives 1600 millimetres of rain annually, with eighty percent falling during the monsoon between June and September, and significant variance between the lowland and the mountains (Hunter and Yonzon 1992). Average national temperatures range from a low of -4.5°C in January to 35.5°C in July. This climatic diversity creates habitat conditions suitable for a wide range of flora and fauna, making Nepal rich in biodiversity.

3.1.4 People and Economy

In ninety years the population of Nepal has grown almost five times from 5.6 million in 1911 to 23.1 million in 2001, with an average growth rate of 2.3% from 1991 to 2001 (HMGN/CBS 2003). The human population is concentrated at the lower elevations with 49% living in the terai, 44% living in the middle hills, and 7% living in the mountains (HMGN/MFSC 2002). The terai is the most densely populated region with 330 people per square kilometre, followed by the middle hills with 167 people per square kilometre (HMGN/MFSC 2002). Rural mountain settlements are dispersed with the least density of all regions at 32 people per square kilometre. The terai region currently experiences the most growth, at a rate of 2.6%, due to natural population increase supplemented by migration from the mountains and hills. This rate has slowed from a high of 4.1%

between 1971 and 1981, following malaria eradication and government resettlement and land clearing programs to encourage migration to the region (HMGN/CBS 2003).

Age distribution is heavily weighted in the younger generation (under fifteen years old) (HMGN/CBS 2003). As Nepalese families favour the birth of a son for economic, social and religious reasons, many families will continue to have children until a son is born (Bista 1967). Although the birth rate is declining, life expectancy is increasing. Despite the preference for males, gender distribution is almost equal. Household size varies throughout Nepal based on distinct cultures, with some more likely to have large households consisting of several nuclear families. Historically, due to a dependence on agriculture, households were large in order to distribute subsistence duties; however, as employment outside of traditional agricultural activities becomes more popular, large households are becoming less common as families divide into separate dwellings. Currently, the average household size is 5.4 people (HMGN/CBS 2003).

Agriculture and pastoralism, on a subsistence or market basis, is the primary activity among the majority of the population, and is the largest contributor to Nepal's GDP at 40%. The contribution of agriculture to GDP has, however, been declining since 1990 (HMGN/CBS 2003). Although 86% of the population continues to live in rural areas, the percentage of the total population living in urban areas has been increasing from a low of 3% in 1952 (MOPE 2002). Urban migration is high among youth from rural areas, threatening to weaken the livelihood connection and traditional knowledge that the protection of resources depends on, while at the same time holding promise to curb subsistence demands on natural resources. Natural resources are essential to rural livelihoods providing fuel, fodder, construction materials, medicine, and food

(HMGN/MFSC 2002). Wood is the primary source of fuel for cooking, used by 66% of households throughout Nepal, and by 94% in rural areas.

Many citizens have only limited access to education, health care and clean water. Despite the 14% increase in literacy between the censuses of 1991 and 2001, only 54% of the total population ages six and above is literate (HMGN/CBS 2003). Literacy is higher among the male population; however, the percentage of females enrolling in all levels of education has been continually increasing (HMGN/CBS 2003). Access to improved drinking water is available to 82% of the population, and 47% of households have toilet facilities (HMGN/CBS 2003). Half of Nepal's population lives below the poverty line with the average annual gross per capita income of less than US\$210, which makes Nepal one of the poorest countries in the world (NESAC 1998).

Nepal's diversity is not limited to climatic or ecological zones; despite its size, the country is also diverse in culture, religion and language. Nepal is the only constitutionally defined Hindu kingdom on earth; while 81% of the population self-classifies as Hindu, Buddhism is the second largest religion in the country and is practiced by 11% of the population (HMGN/CBS 2003). These two religions are becoming increasingly meshed as people begin to consider themselves as followers of both Hinduism and Buddhism. The remaining population participates in a number of different religions, with Christianity, Islam and Sikh rising in popularity.

The people of Nepal are socially segmented by distinct ethnicities or castes. The 2001 census reported more than 100 different ethnicities and castes (HMGN/CBS 2003). Until only recently, individual groups remained isolated from one another, maintaining distinct languages and social rules governing ceremonies, traditions, and beliefs (Bista

1967). Those groups that fall into the Hindu caste system are segmented into a hierarchical order that determines occupation, social interaction, and status, with the lowest-caste groups classified as 'untouchable'. Interaction between untouchable castes and higher castes are rigidly defined, with untouchables being completely segregated by social norms and unable to interact with other castes. Untouchable castes typically fill the most demeaning occupations, and, therefore, are often the poorest in the country. Ethnic groups are characterized more by differentiation than by rank, yet have been placed within the hierarchy of the Hindu caste system (Bista 1967; NESAC 1998). Despite the legal foundation established in 1962 to end discrimination based on caste and ethnicity and the Constitution of 1990 calling for equality for all castes and ethnicities, social segmentation is engrained in the history of Nepal and persists (NESAC 1998).

3.1.5 Political Climate

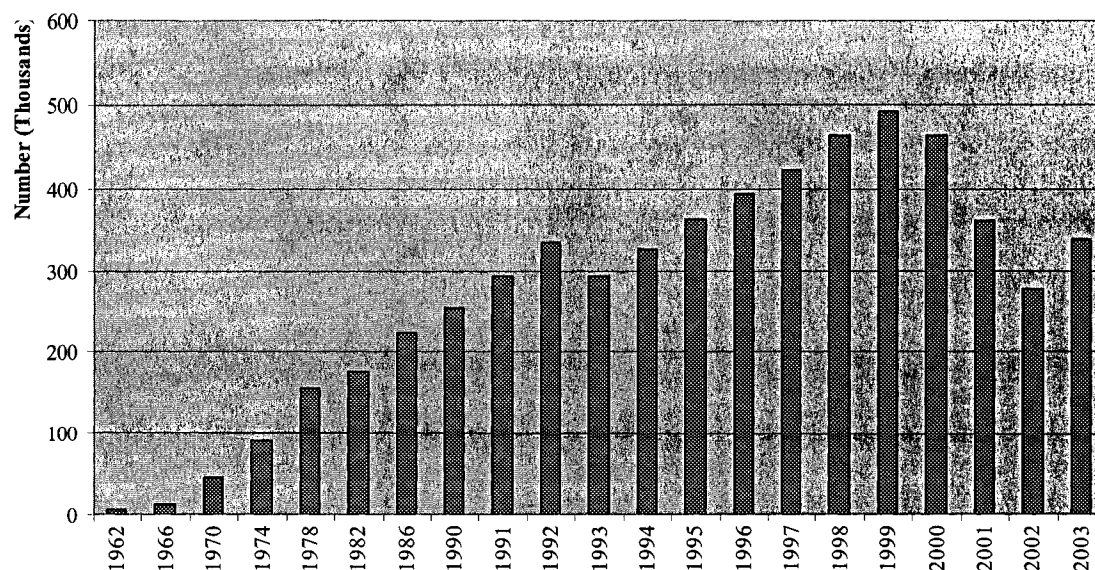
In order to understand the context within which conservation occurs in Nepal, it is necessary to discuss the historical and present day political situation in the country. Until the 1950's, Nepal was governed for a century by hereditary prime ministers from the Rana family lineage. In 1951, the Rana dynasty was overthrown by King Tribhuvan, patriarch of the current monarchy, and replaced with a multiparty democracy. Over the following years, the parliament was characterized by corruption and rapid change, leading the then King Mahendra to institute a 'Panchayat' system in 1962, which involves giving the power of appointment to the King by abolishing multi-party parliamentary elections. Following pro-democracy movements, the ban on political parties was lifted in 1990, by King Birendra. In 1991, the first democratic elections took place, again leaving Nepal with a constitutional monarchy and multiparty democracy. In

2001, King Birendra was murdered along with his entire immediate family, leaving his brother Gyanendra as king (Thapa and Sijapati 2003; Upadhya 2004).

Following the reintroduction of a democratic vote, Nepal's political system has been flooded with numerous parties. One division of the Communist Party of Nepal (CPN) led to the eventual formation of the CPN Maoist faction. The impetus behind the Maoists' revolutionary approach to institute a communist republic is to end the discrimination, imperialism, corruption, and poverty typical within the current constitutional monarchy and democracy (Thapa and Sijapati 2003). For the past ten years, the country has been in a state of chaos resulting from the conflict between Maoist insurgents and the government. The initial insurgency began in 1996 with a small group of rebels in western Nepal, in response to the prime minister not fulfilling an ultimatum of forty demands submitted by Maoist leaders (Thapa and Sijapati 2003). The insurgency has since spread to a national network of approximately 10 000 armed rebels (Thapa and Sijapati 2003). Thousands of people have been killed, injured or kidnapped during the conflict, including Maoists, police, army, government officials, teachers, and civilians, but most deaths have come since the end of the 2001 ceasefire. Police and army brutality and murder of innocent civilians have led to increased Maoist sympathy and support for Maoists among civilians and caused many to join the insurgent forces. Poor and low-caste citizens, typically oppressed and neglected by social norms, have found acceptance without discrimination by the Maoists – a major contributing factor to the growing support for the insurgency. The power the Maoists have achieved is evident in their ability to impose a *bandhs*, or general strike, adhered to by people afraid of reprisal. Both the Maoists and the Royal Nepal Army (RNA) have committed human rights

atrocities, instituting a state of panic throughout the country, with local people and individual freedoms caught in the crossfire. Already depressed, the economic and social situation in Nepal has worsened as a result of the turmoil: foreign investors have withdrawn, aid has been suspended, infrastructure has been destroyed, the country's workforce has fled overseas, education has been hindered, government budgets have been diverted to fund domestic security, and tourist arrivals have drastically declined since 1999 (Thapa and Sijapati 2003; see Figure 3.1). In January of 2005, the King declared a state of emergency, dissolving parliament and revoking democracy (Heinen and Shrestha 2006). In late April 2006, following extensive public protests, the King agreed to reinstate parliament and an interim multi-party government has been formed (Majumder 2006). While the Maoists have declared a ceasefire, and an elected democratic government will be given the task of devising a new constitution, the future prospects for peace remain uncertain.

Figure 3.1: *Nepal's tourist arrivals (1962 - 2003)*



Source: HMG and Ministry of Culture, Tourism and Civil Aviation 2003.

3.1.6 Biological Significance

Biodiversity, as defined in the Convention on Biological Diversity (CBD), refers to “the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” (CBD 1992, Article 2). Nepal’s drastic altitudinal and climatic diversity create a unique matrix of ecological conditions suitable to support a wide range of biodiversity. Nepal hosts 5160 species of flowering plants, including 246 endemics (Shrestha and Joshi 1996), approximately 181 species of mammals, and 844 species (8.5%) of the world’s bird species (Shrestha 1999). The richness of bird and mammal species decreases as altitude increases; therefore, the terai represents the most biologically significant region in terms of fauna richness (Hunter and Yonzon 1992). Flora species richness is highest in the middle hills, yet the mountain zone is host to the largest portion of flora endemic to Nepal (Veetaas and Grytnes 2002). Although Nepal represents only 0.09% of the world’s land mass, it hosts a disproportionately rich genetic, species and ecosystem diversity of flora and fauna (HMGN/MFSC 2002).

3.1.7 Threats to Biodiversity

The challenge for conservationists rests with balancing this rich ecological diversity with an increasing human population, in one of the poorest countries in the world. Like many developing countries, Nepal is host to an array of flora and fauna at risk. The social, ecological, political and economic circumstances in Nepal combine to create a difficult arena for the conservation of biodiversity and for future sustainability. The main implications of population growth, poverty, political conflict and consumerism to Nepal’s

biodiversity can be divided into three categories: (1) land conversion; (2) over-exploitation of forest resources; and (3) illegal hunting, poaching and trade (Chaudhary 2000; Parajuli and Pokhrel 2002). The resulting impacts of these consequences combine to degrade biodiversity through the erosion of soil, land slides, pollution of water, disruption of ecosystem processes, and, ultimately, loss of the very natural resources on which people depend.

Land conversion

Stresses on natural resources have increased exponentially with population growth, resulting from extensive areas of land being cleared for settlement. As average household size decreases and / or household income increases, land conversion accelerates with increased demand for land to build separate dwellings or larger homes (Weaver 1998). The demand for land has placed substantial strain on the forest cover in Nepal.

Agriculture, as the primary activity of 90% of the population, is responsible for a large portion of past and present levels of deforestation (Shrestha 1999). As of 2002, forests covered 29% of the country's land area, and were decreasing at an annual rate of 1.7% (HMGN/MFSC 2002). Traditional farming practices of shifting cultivation and slash and burn led to the deterioration of forests in the middle hills region, and, with years of intensive cultivation, existing agricultural lands were rendered unproductive, fueling a push to migrate to other regions (Weaver 1998; Chaudhary 2000). Resettlement programs initiated by the government in the 1950's are responsible for the conversion of large tracts of forest to cultivated land in the terai. Migration from the mountain and hill ecoregions to the terai continues today and threatens the remaining vegetation of this

once densely forested area (Heinen and Shrestha 2006). In the fifty years between 1927 and 1977, the forested area in the terai declined by almost 60% (Nagendra et al. 2005). Forest clearing contributes a further annual loss of 20 to 25 tons per hectare of topsoil through erosion (HMGN/MFSC 2002). As urbanization trends increase, deforestation rates may level out; however, current population growth trends in rural areas continue to indicate future strain on forested areas and the biodiversity these areas support.

Over-exploitation of natural resources

Natural resources, including timber and non-timber forest products, are required by most rural residents, especially the poor, in order to meet subsistence needs (Matthews et al. 2000; Nightingale 2003; Pandit and Thapa 2004). Rural residents' time is mostly spent in the forest collecting resources. Timber is collected as fuel for heating and cooking, and is used in building construction, and furniture and tool making. Herbs, plants, grasses, bushes and berries are collected for use in traditional medicine, cooking, house construction, as fertilizer, and as weaving materials for crafts and necessary tools. Livestock are taken into the forest to feed, or fodder is collected for stall feeding. Harvesting has been uncontrolled, and conducted in a fashion that impedes regeneration. Users are not educated in sustainable harvesting practices, indiscriminately removing roots, rhizomes and tubers, thus eliminating chances for yielding resources in the future (Chaudhary 2000). As the population continues to grow, an increasing number of people harvest natural resources, leaving forests in a degraded condition, threatening species survival.

Illegal hunting, poaching and trade

The market for wildlife products has led to the decline of wild species in Nepal, and despite international efforts to end the trade in endangered species, illegal trade continues. Among the most popular animal products traded from Nepal are gall bladders of the Himalayan and sloth bears, tiger bones, rhinoceros horns, deer musk, and snow leopard pelts (Parajuli and Pokhrel 2002). The economic value placed on rare animal products creates a strong temptation among the poor to participate. In the majority of cases in Nepal, poaching of wildlife is organized by wealthy outsiders who entice disadvantaged local residents to assist in their activities (Bajracharya et al. 2005). Local people justify illegal killing of wild animals as retaliation for crop raids, livestock depredation and threats to human safety (Mishra et al. 2003; DNPWC 2004; Ikeda 2004), although some hunting for meat is done on a subsistence basis. With the current state of political turmoil in the country, illegal poaching has become more of a persistent problem (DNPWC 2004; Bajracharya et al. 2005; Heinen and Shrestha 2006). Despite the current penalty of US\$1370 and / or fifteen years in jail for killing endangered wildlife, poaching remains a serious problem in Nepal (Smith et al. 1998; DNPWC 2004).

3.2 Conservation Initiatives

3.2.1 Forest Management

Environmental protection in Nepal extends well beyond the country's more recent history of establishing national parks and conservation areas. Limiting access to certain locations has been practiced for many years, as some of the region's protected areas began as royal hunting reserves or sacred forests (Nepal 2002; Heinen and Shrestha 2006). During the Rana dynasty from 1846 to 1951, the management of natural

resources, particularly forests, was through traditional management systems, with little emphasis on conservation. Population size and density at that time precluded any real need to limit resource use for conservation purposes, yet tracts of forests were set aside for spiritual purposes.

In 1957, under the Private Forests Nationalization Act, control over management was officially removed from the local level. The Act was deemed necessary to protect the remaining forests in the terai from conversion to agriculture, but it rendered traditional management systems obsolete in the hills and mountains and created open access to the resource (Gautam et al. 2004b). This loss of community-based management left little incentive for local people to maintain traditional conservation ethics and resulted in increased threats and pressure on the environment (Nepal 2002).

Following the Nationalization Act, rapid deforestation continued, and even accelerated in some regions, leaving the government to finally realize that forest conservation could only be achieved with the cooperation and participation of local people. The government attempted to restore control to communities by amending the Forest Act in 1977 to include new categories of forest, allowing for the designation of specific patches of forested areas to a community, religious group or individual (Gautam et al. 2004b).

Today, forests in Nepal are assigned to six categories by the 1993 Forest Act (HMGN 1993). Five categories are classified as 'National Forest' and include government-managed forest, protected forest, community forest, leasehold forest, and religious forest. The final category, private forest, can be held by any individual where a forest has been planted, nurtured, or conserved on private land. Except where the Act clearly specifies

rights to access, National Forests are protected from public use in much the same way as an area protected for conservation: extraction, hunting, settlement, and grazing are prohibited. Government forests are any national forests not designated within another forest category, and any portion of government forest can be declared a protected forest by the government if the area holds ecological, scientific or cultural importance. Designated user groups or institutions can be allotted control over the remaining three categories (community, leasehold and religious forests), but His Majesty's Government retains ownership of the land and can withdraw rights at any time if activities are harmful to the environment. Community forests are determined by the District Forest Officer and handed over to community user groups to be developed, conserved, used and managed according to Work Plans created by the group, and approved by the officer. Amendments to the Act in 1999 and 2001 require community forest groups to make mandatory contributions of 25% of income to development and conservation of the forest, and 40% of income generated from the sale of surplus forest products for commercial use (Gautam et al. 2004b).

3.2.2 Evolution of a Protected Area Network

The indiscriminate deforestation occurring in the terai raised concerns over diminishing habitat and the threat of extinction for wild animals. As a result, the Wildlife Conservation Act, 1957, was created to provide a legal basis on which to protect wildlife, specifically the one-horned rhinoceros. In 1973, as international concern over species extinction grew, the government passed the National Parks and Wildlife Conservation Act (NPWCA), leading to Nepal's first designated national park, Royal Chitwan. The Act prohibits human use of park land for settlement, extraction, hunting, and grazing, but

allows for the development of tourism facilities. Three categories of protected areas are identified under the Act: national parks, wildlife reserves, and hunting reserves (HMGN 1973).

The initial years of government-led conservation projects were characterized by authoritarian, top-down approaches that neglected the livelihood needs of local people, resulting in adverse social consequences. This approach created animosity among local communities towards conservation efforts and authorities and is thought to have led to more severe environmental repercussions for biodiversity (Nepal 2002). Later conservation initiatives acknowledged the limitations of the top-down approach and focused on including local people within protected area boundaries and in the planning and management processes. The liberalization of conservation approaches to adapt a social justice approach may have been fuelled by a need to conform to international trends in order to secure donor funding (Heinen and Shrestha 2006). In 1986, an amendment to the Act created the new protected area category of Conservation Area, which provided a legal means of identifying areas of biological significance where human needs precluded exclusionary management schemes and called for an integration of conservation and development mandates. The same year a pilot project began in the Annapurna region under the management of King Mahendra Trust for Nature Conservation (KMTNC), a non-government, non-profit organization created under the King Mahendra Trust Act, 1982. Annapurna Conservation Area (ACA) became the first region designated specifically for the purpose of managing for biodiversity conservation and human use.

A further amendment to the Act in 1993 allowed for the participatory approach taken in conservation areas to be modified and applied to regions bordering exclusionary national parks and reserves as buffer zones (MFSC 2000; Heinen and Shrestha 2006). The Buffer Zone Management Regulation, 1996, includes a provision to allocate 30 to 50% of protected area revenue towards community development in the entire periphery region designated as a buffer zone. The regulations also outline the rules for forming local user committees and work plans for allocated development funds. Funding for development proposals is distributed according to the population and area of the buffer zone, the total number of proposals submitted and specific characteristics of each individual user committee, such as proximity to protected area boundary which determines impacts on livelihood, contribution of local people to conservation, and local interest (HMGN 1996). The Regulations also include a provision for declaring forested regions, similar to the Forest Act (1993), as buffer zone forests, buffer zone community forests, buffer zone religious forests, and buffer zone private forests. Buffer zone community forests are regulated under user committee work plans, allowing fees to be collected for resource use.

The recognition of buffer zones as a management strategy for national parks endorses the principles of landscape level conservation. With the acknowledgement of the limitations of existing fragmented protected areas to provide sufficient habitat to support large mammal populations, these principles have become incorporated into Nepal's overall conservation strategy in recent years (Heinen and Shrestha 2006). With neighbouring India and China, Nepal has established trans-boundary protected areas to extend the habitat available for wildlife conservation. In addition, a number of

educational and development initiatives have been initiated outside of protected areas and buffer zones to encourage conservation practices and provide secure corridors to facilitate wildlife movement. By embracing a landscape-level conservation approach, Nepal has once again been well poised to secure international funding for development projects in support of extending conservation efforts outside of protected areas.

3.2.3 International Treaties

Nepal is also a signatory to a number of international treaties supporting biodiversity conservation (Shrestha 1999). In 1998, Nepal signed the Ramsar Convention (1971), supporting the conservation of wetlands in recognition of their ecological significance in regulating water flow and providing habitat functions in sustaining birds, waterfowl and wildlife. Four Ramsar sites have been designated in Nepal. Nepal became a party to the World Heritage Convention (1972) in 1978. Nepal has two cultural sites and two natural sites designated as World Heritage Sites under the convention, including Royal Chitwan National Park. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973), is the result of international efforts to control trade of endangered and threatened species. Nepal acceded to CITES in 1975, and the National Parks and Wildlife Conservation Act became the original legislation for implementing CITES. In regions outside of protected areas, the 1993 Forest Act provided the basis for implementing CITES (Shrestha 1999). Nepal currently has 54 species listed under Appendix I of CITES, which prohibits trade other than in exceptional circumstances.

Perhaps of most significance to national level management of biodiversity is the international Convention on Biological Diversity (1992). As a result of Nepal's signing of the CBD, the Nepal Environmental Policy and Action Plan (NEPAP) was developed in

1993. NEPAP called for building the institutional capacity of the DNPWC, ensuring the protected area system was representative of Nepal's major ecosystems, involving local people directly in protected area management, preserving endemic and endangered species and their habitats, and supporting the research role of outside private and public institutions (Shrestha 1999). The signing of the CBD also led to an influx of foreign funding and support for biodiversity research and building institutional capacity (Heinen and Shrestha 2006).

3.2.4 Overview of Protected Areas

Today, despite its size and population, Nepal maintains a network of protected areas totaling 27 703 km², representing 18.8% of the country's land and including, nine national parks, nine buffer zones, three wildlife reserves, one hunting reserve, and three conservation areas (Appendix 3.1). Because of the history of development of protected areas in Nepal, this network provides a variety of approaches ranging from exclusionary core zones with buffer zones to inclusionary biosphere reserves.

Partnerships between non-governmental organizations (NGOs), international non-governmental organizations (INGOs) and government have been formed to create unique management approaches in each protected area. National parks, wildlife reserves and hunting reserves are primarily managed by the DNPWC and guarded by the Royal Nepal Army (RNA). Access to these protected areas is restricted without an entry permit. Surrounding buffer zones are cooperatively managed by the DNPWC and local communities, with additional projects initiated by NGOs and INGOs.

3.2.5 Challenges for Incentive-Based Conservation in Nepal

Incentives are recognized as important components of any conservation strategy; for local people to protect natural resources the benefits must outweigh the costs. The main incentive strategies employed in conservation areas and buffer zones in Nepal focus on economic development, specifically through tourism promotion, infrastructure improvements, and support for social programs.

Despite Nepal's extensive network of protected areas, supporting biodiversity conservation remains difficult. Deforestation, resource extraction and poaching continue today. Similar to other conservation efforts in developing countries throughout the world, gaining the support of local people for conservation efforts has its share of difficulties. The costs borne by local residents in the name of conservation are significant, and include loss of homeland through relocation, limited or no access to resources necessary for livelihood activities, damage of crops and loss of livestock from wildlife predation, and threats to human safety. The social stratification in Nepal makes equity in participation and distribution of conservation benefits and access to resources difficult. Nepal's rapid population growth also makes the distribution of benefits to all affected from protected area management difficult. The political conflict rampant throughout the country is hampering outreach efforts by protected area managers. With a population expected to reach 38 million by 2025, the effects of globalization and technology on local culture and the pressing need to preserve the world's biodiversity, Nepal faces a potential environmental and social crisis unless the conflicts between local communities and conservation objectives can be resolved.

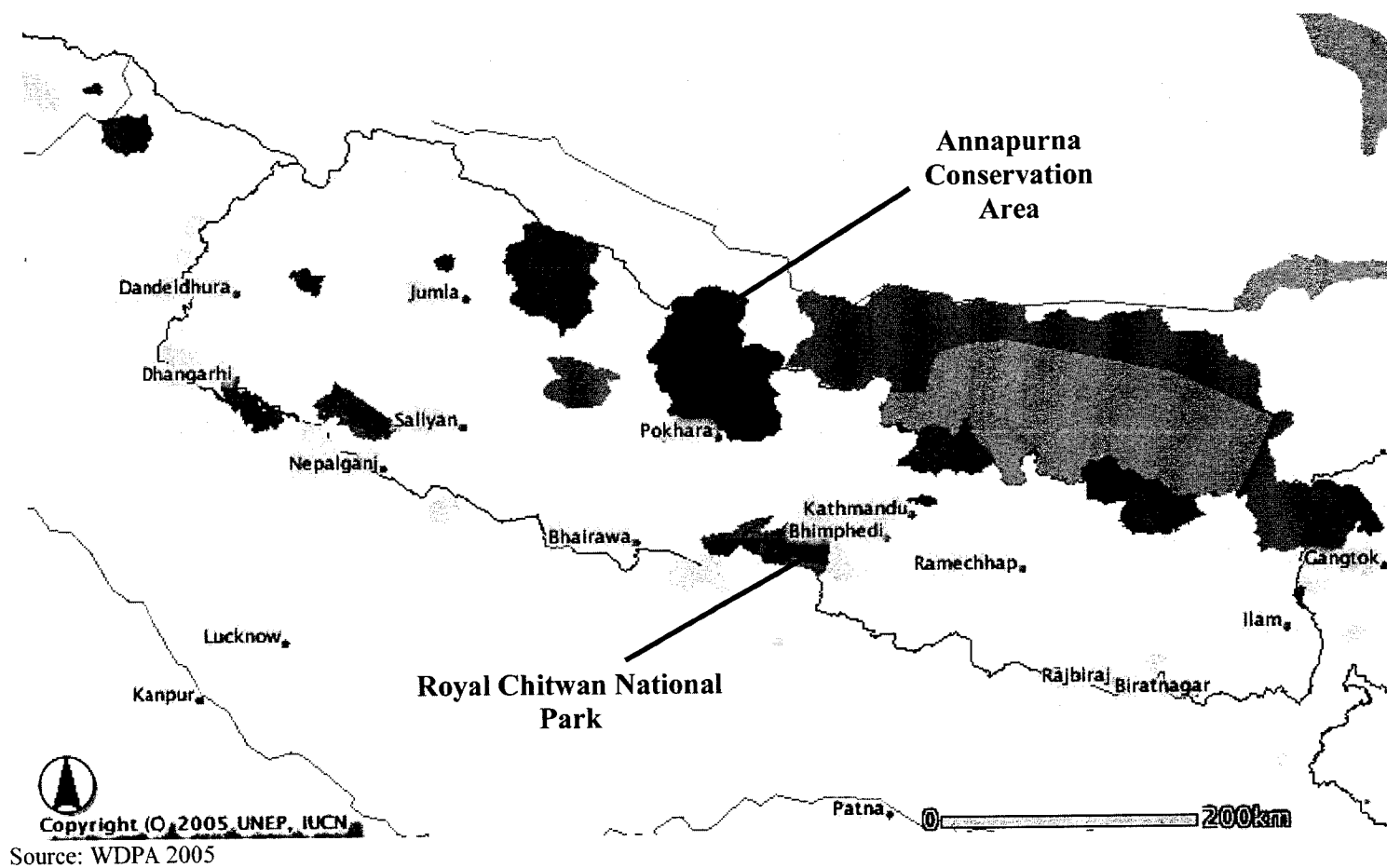
For the scope of this project, two representative biodiversity conservation projects in Nepal have been selected to examine IBPs: Royal Chitwan National Park (RCNP) and Annapurna Conservation Area (ACA). Figure 3.2 shows the locations of these conservation projects. Table 3.1 provides a comparative summary of the features of RCNP and ACA.

Table 3.1: Characteristics of RCNP and ACA

	Royal Chitwan National Park	Annapurna Conservation Area
Approach	Core zone with buffer	Biosphere reserve
Management	Government – DNPWC	National NGO – King Mahendra Trust for Nature Conservation (KMTNC)
Size	932 km ² , plus 767 km ² buffer zone	7629 km ²
Year Established	1973 (Buffer zone 1996)	1986 (pilot program) 1992 (Conservation Area designation)
Elevation	From 150m to 815m	From 450m to many peaks over 7000m
Annual Precipitation	2000mm to 2400mm	Ranges from 250mm in the northern plateau to 6000mm in the south
Temperature	Summer high 30°C Winter low 15°C	Summer high 30°C Winter low 8°C
Endangered Wildlife Species	One-horned rhinoceros (<i>Rhinoceros unicornis</i>), Bengal tiger (<i>Panthera tigris</i>), leopard (<i>Panthera pardus</i>), wild dog (<i>Cuon alpinus</i>), sloth bear (<i>Melursus ursinus</i>), Ganges river dolphin (<i>Platanista gangetica</i>), gaur (<i>Bos gaurus</i>), hispid hare (<i>Caprolagus hispidus</i>), elephant (<i>Elephas maximus</i>), gharial (<i>Gavialis gangeticus</i>)	Snow leopard (<i>Panthera unica</i>), Himalayan black bear (<i>Ursus thibetanus</i>), red panda (<i>Ailurus fulgens</i>), musk deer (<i>Moschus chrysogaster</i>), clouded leopard (<i>Neofelis nebulosa</i>)
Population	223 000 in surrounding area	120 000 in ACA
Ethnic Groups	Indigenous – Tharu Immigrants – Brahmin, Chhetri, Tamang, Gurung, Newar, Magar, Sarki, Damai, Biswakarma, Chepang, Darai	Thakali, Manange, Loba, Gurung, Magar, Brahmin, Chhetri, Damai, Kami
Subsistence Activities	Agriculture, farming	Agriculture, pastoralism, trade, tourism
Annual Tourism Visitation	77 266	66 320

Sources: Nepal and Weber (1993, 1994); Heinen and Mehta (1999); Stræde and Helles (2000); ADB (2001); KMTNC (2002); MFSC (2002); MFD (2004)

Figure 3.2: Map of study area locations



3.3 Royal Chitwan National Park

3.3.1 Physical Environment and Biodiversity Significance

RCNP is located in the terai region of south central Nepal on the border of India and covers an area of 932 km², with a surrounding buffer zone of 767 km². The park is bordered to the east by Parsa Wildlife Reserve (499 km²) and buffer zone (298 km²), and to the south by the Valmiki Tiger Reserve, India. RCNP is world-renowned for an abundance of unique and internationally significant flora and fauna and a rich cultural heritage, and was declared a World Heritage Site in 1984.

Climatic conditions are subtropical with a summer monsoon from mid-June to late-September, when 90% of the mean annual rainfall of 2400mm occurs. Temperatures are highest (maximum 30°C) during this season and reach a low of 15°C in January, when dry northerly winds from the mountains are prevalent (Stræde and Helles 2000). The region's topography and vegetation are largely determined by the three major rivers located within RCNP: Narayani, Rapti and Reu. Annual monsoon rainfall and associated flooding result in erosion and alluvial deposits that create various vegetation patterns and stages of succession. The climax vegetation is sal (*Shorea robusta*) forest, comprising 70% of the park (Nepal and Weber 1993). The park is home to a number of endangered or threatened species including the one-horned rhinoceros, Bengal tiger, leopard, wild dog, sloth bear, Ganges river dolphin, gaur, hispid hare, Asian elephant, and gharial (Nepal and Weber 1994). The habitat in RCNP also supports 489 bird species, some of which are endemic to Nepal.

3.3.2 Park History

Prior to Chitwan's classification as a national park in 1973, the region had a long history of conservation efforts dating back to the 1800's when the area was utilized as a royal hunting reserve (Nepal and Weber 1993). In response to rising population pressures, the government created a 544 km² wildlife sanctuary in 1962 and, two years later, resettled 22 000 people outside of the boundaries of the national park (Nepal and Weber 1993; Stræde and Helles 2000). The park is now surrounded by thirty-five Village Development Committees (VDCs) and two municipalities with a total population of over 223 000 people (MFSC 2000). National internal migration figures show a continuous trend of migration from the hill and mountain regions to the lowland terai (HMGN/MFSC 2002). With the final relocation process beginning in 1994, the last VDC in RCNP, Padampur, has been completely removed from the park to a region outside of the buffer zone. Residents relocated from Padampur have been less than satisfied with the compensation package provided by the park, in terms of money, and location, amount and quality of land (McLean and Stræde 2003).

The loss of access to park land continues to create hardships for people who rely on nature for subsistence activities such as resource collection, agriculture and livestock grazing. Apart from being uprooted from their land and restricted from the use of resources, the local people have had to face the ongoing threats of crop raids, predation and injury or death from park wildlife (Nepal and Weber 1993). As a result, local communities have less than favourable attitudes towards conservation and park

authorities (McLean and Stræde 2003) and the integrity of the park continues to be threatened by illegal poaching of wildlife and forest products and livestock grazing (Nepal 2002).

In response to conflicts between community needs and conservation objectives, and based on recognition of the need for landscape scale conservation to meet the habitat needs of wide ranging mammals, DNPWC established a 767 km² buffer zone surrounding the park in 1996 (Nepal and Weber 1994; Smith et al. 1998; Stræde and Helles 2000). This buffer zone allowed for continued private land ownership and community involvement in management with the hope of creating a mutually beneficial relationship between local citizens and park authorities. Community forests in the buffer zone provide alternative sources of resources to local residents, and support wildlife through habitat conservation. Habitat connectivity is further enhanced by the Barandabhar Forest, which acts as a corridor linking the national park to forested regions in the middle hills. The pressure on park resources is reduced and contributions to the overall conservation goals of the park are made by building resource capacity in the buffer zone and creating livelihood opportunities to alter dependence on natural resources (Smith et al. 1998; MFSC 2000).

3.3.3 Resource Use

In 1976, with the hope of reducing illegal resource poaching and creating positive attitudes towards the park, a program was introduced that allowed for the collection of grass for fuel and building materials for a twenty-day period in January. The period of open access was reduced four times in the program's history, with the last adjustment to only three days. In 1999, an estimated 55 000 tonnes of biomass valued at approximately

US\$ 1 million were removed by 60 000 to 85 000 people per day over a ten-day period (Stræde and Helles 2000). Based on the research conducted by Stræde and Helles (2000), the overall effectiveness of this program is questionable. Forest products not permitted under the grass cutting program were extracted illegally and accounted for half of the total quantity and value of all products collected (Stræde and Helles 2000). The designated timeframe does not effectively meet local needs, due to seasonal variation in the availability and quality of some crops. Also, allowing crowds of people to enter the park within such a limited period places substantial demands on resources and undue pressure on resident wildlife. As a result, human-wildlife conflicts increase at this time of year, creating further distaste among locals for conservation efforts (Stræde and Helles 2000).

Although all other extraction is illegal, the park continues to fulfill needs of villages within the buffer zone for resources (Nepal and Weber 1993; McLean and Stræde 2003). Wood is the primary source of energy used by 88% of households surrounding RCNP, with the park supplying 34% of households (MFSC 2000). The majority of households require a monthly supply of 175 kg of wood or more. Despite the increasing trend towards stall feeding of livestock, 23% of households in the buffer zone continue to fulfill their demand for fodder within the park. More than 525 kg of grass are needed each month to fulfill the individual needs of 70% of the households. The indigenous Tharu live in traditional dwellings requiring the extraction of grasses, reeds and other products from the forest for house construction (McLean and Stræde 2003).

Poaching of wildlife is primarily conducted on behalf of outsiders by local residents seeking economic rewards (DNPWC 2004). Wild animals do not provide an important

source of meat for consumption. Tiger, elephant and rhino are the most sought after species on the international market and yield the greatest financial return, while deer and boar are only occasionally killed as a local food source. Poaching levels fluctuate year to year, with 30 rhinoceros killed by poachers in RCNP between 2002 and 2003. Current figures suggest a decline in poaching, yet the political situation that has led to a decrease in army personnel deployed for poaching patrols could be responsible for a deflated report in poaching occurrences (DNPWC 2004). Poaching may actually be on the increase due to hunting pressure of insurgent forces in the forests and local participation in hunting for financial return due to the decline in enforcement and corresponding decrease in the threat of being caught, fined or jailed (DNPWC 2004).

3.3.4 Wildlife Conflict

Villages surrounding the park suffer substantial losses from protected wild animals. Increases in crop loss or damage, livestock predation, and human injuries and fatalities illustrate the success of species conservation efforts (MFSC 2000; McLean and Stræde 2003). Wildlife populations have increased, yet with the increase in competition from domestic livestock for grazing, loss of suitable habitat within the park due to grassland conversion, and an increase in habitat conservation outside the park, wild animals are increasingly leaving the park to forage and hunt (Dinerstein et al. 1999; MFSC 2000). Crop damage is reported by 88% of villages in the buffer zone, with rhinoceros, boar, deer, elephant and birds responsible. Tigers prey on livestock, with 68% of villagers indicating predation as a moderate to high concern. During the fiscal year between 2003 and 2004, seventeen people were killed by tigers and three by rhinos (DNPWC 2004). These figures have increased since the fiscal year between 2001 and 2002, when seven

people were killed by tigers (DNPWC 2002a). Conflicts between humans and wildlife present a real threat to local livelihoods and conservation attitudes, and inhibit long term efforts to protect endangered species.

3.3.5 Management Structure and Partners

RCNP is managed by the DNPWC, with special power over protection and management given to the chief park warden. The park is divided into four administrative sectors to facilitate management, with the headquarters in the central sector, Kasara. Staffing levels are insufficient to fulfill patrolling and park protection duties (MFSC 2000). Since 1975, the RNA has been responsible for enforcing the rules and regulations of the park, with one thousand personnel working in this capacity. The RNA receive support from anti-poaching units (APU) formed with outside funding and comprised of park employees and community volunteers.

The primary management goal of RCNP is to protect endangered species. The park adopts a preservationist approach to resources within the boundaries, and management interventions support this goal through active habitat and species manipulation and restrictions on human access and resource extraction. The Management Plan (2001-2005) identified zoning as an important tool to limit wildlife and vegetation disturbances in the park. Under the plan, the park would be divided into three zones: core zone, utility zone and management facility zone. In the core zone, human access would be completely restricted except for research purposes. Through habitat conservation, the park administration hopes to minimize damage to crops in the buffer zone by fulfilling habitat needs of wildlife within park boundaries, and, as a result, decreasing conflict with surrounding communities. Fire suppression, prescribed burning, extraction of exotic

plant species, wetland restoration, livestock grazing prohibition, and annual regulated grass harvesting are main components of the habitat management program (MFSC 2000).

Wildlife populations are actively managed through breeding and reintroduction programs for endangered or locally extinct species. For example, the park operates the Gharial Breeding Centre for the purpose of securing wild eggs of the endangered crocodile. As of 2004, 641 crocodiles have been returned to the wild (DNPWC 2004). With the success of past management interventions to rehabilitate populations of one-horned rhinoceros, current management of this species involves relocating population surpluses to avoid intra-species grazing competition, and corresponding localized extinctions. The rebound in populations of endangered wildlife is the direct result of the strict protection approach taken by the DNPWC against poaching and habitat encroachment (Dinerstein et al. 1999).

However, upon recognition of the spatial limitations of the park to support populations of large mammals, especially endangered tigers and rhinoceros, the DNPWC has been forced to think beyond exclusionary conservation and approach wildlife management at a landscape scale. The designation of two protected areas on the borders of RCNP helped to restore connectivity of wildlife habitat, but research into tiger population distributions indicate one-third of land used by tigers in the Chitwan area remains outside of these protected areas, and 25% of breeding tigers live on this land (Smith et al. 1998). The extension of conservation efforts beyond the official park boundaries through the establishment of dispersal corridors requires incorporating local people into overall park management. Designating the periphery of the park as a buffer zone contributes to landscape scale management by encouraging local stewardship and

regenerating forests as buffer zone community forests to increase wildlife habitat outside of the park. While improving local livelihoods is not the primary objective of the park, projects conducted in the buffer zone to support endangered species conservation offer significant contributions to social welfare.

The second objective of the DNPWC is to support tourism. Tourism has been promoted since the inception of the park and contributes 92% of the park's revenue (DNPWC 2004). The first tourist facility located in the park was constructed prior to the establishment of RCNP (MFSC 2000), and today seven hotel concessionaires operate within the boundaries. Entry permits required of park visitors provide the largest source of revenue. Other revenue sources include camping fees, elephant rides, hotel royalties, canoe trips, and vehicle permits for the operation of jeep safaris in the park (DNPWC 2004). Apart from requiring entry permits and keeping records of visitation levels, the park does not actively manage tourism (MFSC 2000). Tourist entry points are concentrated in only a few areas, leading to intensive use and environmental impact in these areas (KMTNC 1996). However, little information is available on the actual impacts and ecological sustainability of tourism (MFSC 2000).

3.3.6 Projects in the Buffer Zone

The management approach applied in the buffer zone is heavily controlled by the DNPWC. Under the direction of the DNPWC and the chief park warden, the Buffer Zone Management Committee (BZMC) is formed from elected representatives to oversee activities (MFSC 2000). The BZMC is comprised of 37 elected chairpersons from buffer zone user committees, four representatives from the legislative districts surrounding the park and the chief warden for a total of 42 members. User committees operate at the

VDC level, and consist of one representative from each of the nine wards within the VDC. Female and male user groups are formed at the settlement level and can join together to form function organizations to accomplish specific activities. The activities of the buffer zone user committees are supported by the DNPWC through the Buffer Zone Support Unit (BSU), a group of park employees responsible for community mobilization for conservation and development.

The National Park Act requires 30 to 50% of park revenue to be redistributed to the buffer zone communities. This revenue is used to fund community development projects, and is assigned based on proposals submitted by user committees to the chief park warden. Financial allocations are provided to user committees and dispersed to various user groups. User groups are expected to provide free labour for development projects in their communities, and pay maintenance fees (HMGN 1996).

In order to address people and park issues in the buffer zone, the DNPWC initiated the Park People Program (PPP) in 1995 with the support of the United Nations Development Program (UNDP) (MFSC 2000). The overall objective of this program was to support biodiversity conservation within and around protected areas, including RCNP, and improve the economic conditions for people living in the buffer zone (DNPWC 2002b). Reducing dependency on natural resources and providing alternative livelihood opportunities were seen as ways to reach these dual goals. When PPP reached the termination of the project timeline in 2001, the DNPWC and UNDP initiated the Participatory Conservation Program (PCP) in 2002, in the hope of continuing the support for biodiversity through the active participation and livelihood improvement of communities in the buffer zone (DNPWC 2002b). Projects conducted in the buffer zone

of RCNP have included: assisting formation of user groups; capacity building through providing training in bookkeeping; accounting and nature guiding; conservation awareness and education activities; wildlife mitigation measures; park infrastructure improvements including watch tower and bridge construction; and grassland and wetland management inside the park (DNPWC 2002b, 2003).

Evaluating the quality of park management cannot be limited to within the boundaries of the park itself, and the activities of only the DNPWC. Activities in the buffer zone are supplemented by the programs and projects initiated by numerous NGOs independent of or in partnership with the DNPWC. Any evaluation of the effectiveness of incentive-based programs in creating support for conservation within the park must encompass the activities of all organizations working in the area; however, a complete list of all NGOs working in the Chitwan area is difficult to compile. KMTNC and WWF-Nepal are two of the major NGOs currently conducting programs in the buffer zone.

KMTNC has developed the Biodiversity Conservation Centre (BCC), which conducts research and outreach within and surrounding RCNP. With the support of international lending agencies, the BCC has implemented the Tiger/Rhino Conservation Project (TRCP), with the objective of reducing pressure on the Barandabhar Corridor Forest through improving economic opportunities outside of the forest (KMTNC 2004). In 2002, WWF-Nepal, together with the support of DNPWC and the Ministry of Forests and Soil Conservation (MFSC), initiated the Terai Arc Landscape Program (TAL) in order to ensure the future ecological, economic and socio-cultural integrity of the terai (WWF-Nepal Program 2004). TAL encompasses a large region totaling 49 500 km², including the buffer zone of RCNP, and operates a variety of programs including anti-poaching

operations, alternative energy development, community forest support, wildlife conflict mitigation, and research and monitoring of endangered species (WWF-Nepal Program 2004).

3.3.7 Tourism in RCNP

The popularity of travel to RCNP has increased in recent years with the number of visitors reaching 77 266 in the fiscal year between 1998 and 1999 (HMGN/MFSC 2002). Tourists are attracted to the region primarily due to the opportunities to view rare wildlife. Tourism has become an important substitute for the loss of traditional livelihood practices for some, and also contributes to local development activities in the buffer zone through the funneling of 50% of entry permit fees received by the park to BZMCs. However, inequities in the distribution of tourism benefits may have fostered less favourable attitudes towards conservation in others.

The employment opportunities and direct economic impact of tourism on local livelihoods are minimal (Bookbinder et al. 1998). In the buffer zone, tourism is concentrated in the Sauraha area with 65 small to medium-size hotels (MFSC 2000). According to Bookbinder *et al.* (1998), 61% of hotels in Sauraha are owned by non-locals, including immigrants from other regions of Nepal and expatriates, and only 1% of the working-age population in the Chitwan district is employed in the hotel industry. In total, 6.8% of local households either own tourism businesses or are employed in the industry (MFSC 2000). Tourism offers other limited benefits beyond hotel employment, through direct opportunities such as nature guiding, souvenir sales, and park employment, or indirect income from provision of services or products in support of tourism, such as food and transportation.

3.3.8 Study Area

The study area is located on the northern boundary of the park in the buffer zone villages surrounding the main tourist entry gate into the park, Sauraha. This region is part of the Sauraha East Buffer Zone Management Sector which covers 11 440 hectares, including eight VDCs with an approximate population of 54 300 people (MFSC 2000). Brahmin, Chettri, and the indigenous Tharu are the main castes, and farming is the primary livelihood activity.

The selection of the study area was limited due to political instability in 2004 and concerns over researchers' safety in other regions. The study area is close to the Barandabar Corridor forest which provides a link between the national park and the middle hills zone, and also includes two community forests with established tourism activities. Of the four management sectors surrounding RCNP, the study area sector has the greatest number of households involved in tourism activities, and therefore does not fully represent all communities included in the RCNP buffer zone.

3.4 Annapurna Conservation Area

3.4.1 Physical Environment and Biodiversity Significance

ACA is located in the Himalayan Mountains in north central Nepal and covers an area of 7629 km². The region is the most popular trekking destination in the country, containing the world's highest pass and lake, deepest gorge, and two of the ten highest mountains. With deep valleys and high mountains, the elevation in ACA ranges from 450 metres to over 7000 metres. The northern portion of the area borders Tibet, China and is a high-elevation desert with little rainfall, while the southern portion of ACA includes some of the highest rainfall areas in the country (Heinen and Mehta 1999). The

spine of the Annapurna massif is an ecological divide between east and west, creating unique habitats on either side. Due to the dramatic altitudinal and climatic variations, the conservation area supports rich biodiversity, including 1226 species of flowering plants, 101 species of mammals, 474 species of birds, 41 species of reptiles and 23 species of amphibians (KMTNC 2002). Several endangered species inhabit the ACA region, such as snow leopard, Himalayan black bear, red panda, musk deer, and clouded leopard (ADB 2001).

3.4.2 Conservation Area History

Suggestions to conserve the Annapurna region began in the late 1970's, due to evidence of environmental degradation from population pressures and tourism impacts. Serious discussions to designate the region as a protected area began in the 1980's. With an understanding of the social and corresponding environmental consequences of exclusionary national parks, and the size and diversity of the resident population, a unique approach to protected area management was chosen. Findings from the protected area feasibility study of the region indicated strong local opposition to the designation of a national park, and illustrated existing community aptitude for conserving natural resources (Sherpa et al. 1986). As a result, an integrated approach to resource management was chosen and applied by combining conservation with sustainable community development, while allowing for continued resource extraction to meet subsistence needs.

ACA is home to over 120 000 people, with a cultural mosaic rivaling the diversity exhibited in the region's natural resources. With such diversity, participation is the fundamental element for success of the ACA approach, requiring active community

involvement in planning, implementation and monitoring of all management activities. Without active local participation, providing the correct development programs to curtail resource demand for such diverse community needs is impossible. ACA was the first protected area in Nepal to allow local residents to live within the boundaries and maintain community access and use of natural resources, and it became a new model for protected areas throughout the world (Wells 1994; KMTNC 2002).

KMTNC initiated the Annapurna Conservation Area Project (ACAP) in 1986, at the request of the federal government. ACAP began as a small scale pilot project of 200 km² in Ghandruk VDC, with expansions planned for in future phases of the project. In 1990, the project grew to 1500 km², encompassing sixteen VDCs. In 1992, ACA was officially declared a Conservation Area, with KMTNC given management authority for a period of ten years. With this designation, ACA expanded to its current size and encompassed 55 VDCs, making ACA the largest protected area in Nepal.

3.4.3 Resource Use

The majority of ACA residents are subsistence-based farmers and pastoralists, heavily dependent on natural resources (Mehta and Heinen 2001). The main crops are maize, buckwheat, barley, rice, millet, wheat, and potato, and the main livestock are buffalo, cattle, sheep, goat, yak, horse, chicken, and jhopa (a yak / cattle crossbreed) (KMTNC and ACAP 2000). Some residents in the northern region are actively involved in trade and migrate to Kathmandu each winter. Although ACA is the most popular destination for international trekking tourists, tourism offers limited contributions to the local economy through employment or revenue (Brown et al. 1997). As a result, the majority of the local population remains dependent on the resources available in the

conservation area. This dependency has proven beneficial to building support for forest conservation, as many residents are concerned with the future availability of resources needed for survival. Local residents depend on the environment for wood, fodder, bamboo, fruit, vegetables, and medicinal herbs (Wells 1994). Wood provides the primary source of energy for heating and cooking and is also used in furniture and building construction. Some residents collect bamboo to make chairs, mattresses, and baskets.

Immediately following the 1957 nationalization of all forests in Nepal, deforestation was rampant in the Annapurna area due to fears over future loss of access (Sherpa et al. 1986). Traditional controls over resource extraction through implied community ownership were lost, creating an open-access tragedy of the commons. Government management of forests proved ineffective, and, in response, prior to the establishment of ACA, community-based sanctions on felling of green trees were reinstituted in some areas to limit forest degradation. Under ACAP, communities have been allotted patches of forest to fulfill subsistence needs; however, new boundaries overlap with traditional access rights of other communities, creating conflict between user groups (KMTNC 1997). Management of natural resources has been assigned to Conservation Area Management Committees (CAMCs) for each VDC, comprised of local representatives. With the primary goal of promoting community development and managing forest resources on a sustainable basis, each CAMC creates its own rules and regulations over resource extraction. Hunting is not traditionally practiced for subsistence purposes, with recent declines in wildlife populations attributable to poaching for external market profits

and crop and livestock protection. Under the National Parks Act, wildlife is protected and poaching is not allowed; however, patrolling is primarily community-based, with no army involvement in enforcement.

3.4.4 Wildlife Conflict

Protected wildlife in ACA can cause significant livelihood losses for local people. Occasionally snow leopard will prey on domestic livestock, and langur and rhesus monkeys are considered to be a nuisance causing damage to agricultural crops (Sherpa et al. 1986). Other pest animals include bear, porcupine, barking deer, marten, fox, jackal and common leopard (KMTNC 1997; Bajracharya et al. 2005). According to Mehta and Heinen (2001), 74% of residents in their study area face wildlife depredation problems. Although uncommon, hunting of wildlife on the part of local residents is primarily motivated by retaliation against or protection from wildlife damage (Sherpa et al. 1986; Bajracharya et al. 2005). In the past, offending animals were shot, but with the current insurgency, guns have been confiscated and villagers resort to other means to relocate, kill or deter wild animals from damaging livestock and crops. For example, as crops ready for harvest, villagers construct and overnight in blinds to scare away predating wildlife. Recent studies suggest wildlife populations are stable or increasing within ACA (Bajracharya et al. 2005), escalating the likelihood of future conflicts between wildlife and humans. ACAP currently has no direct compensation program in place to offset the economic burden of wildlife damage, although ACAP has supported one wildlife mitigation fence to protect livestock in Upper Mustang (KMTNC 2004).

3.4.5 Management Structure and Partners

ACAP's philosophy is guided by three principles: people's participation, matchmaking, and project sustainability. ACA is currently managed by the KMTNC, with the ultimate goal of building capacity for a transfer of management responsibility to local institutions in the future (KMTNC 1997). The management responsibility of KMTNC has recently been extended until 2012 by the government (KMTNC 2004). Projects are determined through a participatory process, and given the diversity of projects assisted by ACAP, the primary role is one of catalyst or matchmaker between local people and expertise or donor support of external NGOs or government organizations. Because of the future goal of local management, projects are only initiated if local people will be able to maintain the project when external support is withdrawn.

Of the 55 VDCs included in ACA, the region is further divided administratively into seven Unit Conservation Offices (UCOs) to facilitate day-to-day management activities and monitor adherence to government rules and regulations (KMTNC and ACAP 2000). In recent years, UCOs in the southern portion of ACA have been forced to close down due to political instability and threats to employee safety, halting conservation and development activities in these areas (Bajracharya et al. 2005).

KMTNC embodies a grassroots approach towards conservation through incorporating local participation in community development, to build support for and commitment to the protection of natural resources (KMTNC and ACAP 2000). Within each VDC, CAMCs have been formed from nine elected members from each ward, three elected representatives from special interest groups such as women, low caste, and social workers, two additional nominated ward representatives, and the VDC chairman

(KMTNC 1997). CAMCs are the main executive body in ACA, and are given authority under the Conservation Area Management Regulation (1996) to plan, implement, monitor and control the resource conservation and development activities within their VDC boundary (KMTNC and ACAP 2000). Meetings are held monthly or bi-monthly to determine action plans for conservation and development. Through active participation, local people become custodians of their natural resources, and determine the direction of development activities. As a result, ACA is self-regulating and does not require the army to enforce rules and regulations.

To facilitate integrated resource management and multi-use principles, ACA is categorized into five land use management zones based on degree of human impact and use of natural resources (KMTNC and ACAP 2000): (i) Intensive use zone, the area of human settlement and surrounding forests where resources have been highly impacted and agriculture, plantations and development are concentrated; (ii) Special management zone, areas with less than 100 years of human settlement primarily developed in response to tourism; (iii) Wilderness zone, the region above seasonal grazing limits of domesticated livestock with no human use except by mountaineering parties; (iv) Protected forest / seasonal grazing zone, located at elevations between wilderness zone and intensive use zone, beyond day-trip distance for resource collection by villagers; and (v) Biotic / anthropological zone, where restrictions on foreign entry have isolated inhabitants and preserved traditional ways of life. Management interventions vary with each distinct zone, and facilitate integrating the mutual objectives of conservation and development over the whole conservation area. The system of zoning in ACA is not much different than the buffer zone concept established around Nepal's national parks.

Human activities are restricted in the ‘core’ zones, similar to the restrictions in national parks; however, in ACA, local people were incorporated into the management plan from the initial development stages, rather than as an afterthought as they are in national park buffer zones.

3.4.6 Projects in the Region

Following over a decade of experience, KMTNC issued a Management Plan for ACA in 1997. The plan outlined the principles and objectives governing KMTNC’s work in ACA, and detailed the programs and policies required for achieving management goals. ACAP aims to improve the socio-economic condition of the local people by integrating conservation and development with the following three objectives (KMTNC 1997; KMTNC and ACAP 2000): (i) to conserve the natural resources of ACA for the benefit of the present and future generations; (ii) to bring sustainable social and economic development to the local people; and (iii) to develop tourism in such a way that it will have minimum negative impact on the natural, socio-cultural and economic environments. Eight management goals were identified by the plan to achieve these objectives, and the following programs have been initiated to fulfill these goals (KMTNC and ACAP 2000): (i) Mobilization of Local People; (ii) Natural Resources Conservation Program; (iii) Alternative Energy Program; (iv) Conservation Education and Extension Program; (v) Sustainable Tourism Management Program; (vi) Community Development Program; (vii) Women in Conservation and Development Program; (viii) Agriculture and Livestock Development Program; (ix) Heritage Conservation Program; and (x) Reproductive and General Health Program.

ACAP has built on existing social organizations to mobilize local people. Prior to the designation of the conservation area, women's groups, *Ama Toli*, were active in the communities. In addition to these groups, and under the umbrella of the CAMC, other sub-committee groups have been formed at the local level to coordinate projects addressing specific needs and to facilitate the other ACA programs. As of 2000, a total of 484 supporting sub-committees had been formed (KMTNC and ACAP 2000). Examples of sub-committees include ones for Tourism Management, Kerosene Depot Management, and Snow Leopard Conservation.

3.4.7 Tourism in ACA

The dramatic scenery and established trail system in the mountains have made Nepal a popular destination for international adventure travelers, with trekking constituting 19.4% of tourist visits in 2003 (HMGN and Ministry of Culture, Tourism and Civil Aviation 2003). ACA draws 61.8% of these trekkers, through a reputation for spectacular scenery, varied topography and altitude, diverse cultures, and an established network of trails. Over 1000 lodges and tea houses have been established to cater to the tourism demands in the region, and a number of guides and porters provide services to trekking groups (Heinen and Mehta 1999). KMTNC has been authorized to charge and collect entry fees from visitors, with a current rate of Nepali Rupees (NR) 2000 per person, per entry. These fees provide the primary source of financing for operations in the conservation area.

Despite the volume of tourists in ACA, the market is spatially and temporally concentrated, creating inequity in the distribution of tourism benefits between villages and regions, and only seasonal employment opportunities (Parker 1997). As for many

popular destinations, guide books on the region recommend prime periods for travel, and, as a result, tourism is condensed into five months of the year: March, April, September, October and November (Wright and Andriamihaja 2002). This temporal and spatial concentration further exacerbates ecological and social impacts from mass tourism to environmentally and culturally sensitive areas. Although the popularity of the region brings much revenue from user fees to support local development programs, tourism has had substantial consequences on the environment, specifically through the effects of deforestation, soil erosion and litter, and provides limited employment opportunities at the local level (Nepal 2000). Although trekking tourism has more than doubled over the past two decades, the political turmoil in the country has contributed to a substantial decline in tourism to ACA since 2001. As of 2003, trekking permits issued for ACA had returned to 1986 levels (HMGN and Ministry of Culture, Tourism and Civil Aviation 2003). The decline in tourist volume has not only directly impacted hotels, restaurants and guide business, but has reduced the finances available through user fees to support conservation and development activities in the protected area, and, in turn, threatens the foundation upon which the success of ACA has been built (Bajracharya et al. 2005).

3.4.8 Study Area

The study area is Jomsom Field Base, located in the northwestern region of ACA in the Lower Mustang District. The Jomsom Field Base covers a transitional zone between the moist southern forests of the Kali Gandaki River, and the dry, semi-arid desert of the north. Nine VDCs fall within the Jomsom field base, with a population of approximately 8600 people. The dominant castes include Mustangi, Baragaon, and Thakali, and the

main livelihood activities are tourism, trade, agriculture and animal husbandry (KMTNC 1997).

As noted above, the selection of a study area was constrained by political instability and concerns over researchers' safety in other regions. The VDC with the longest history of ACAP management is occupied by Maoist insurgents and the headquarters were destroyed by bombs in 2003. Although KMTNC's first project in ACA began twenty years ago, ACAP has been active in the Jomsom region for only fourteen years. The project has not been as well received in the northern districts of Mustang and Manang as in the other project regions (KMTNC 1997). Because of the program's success in the southern regions, awards and evaluations highlighting the success of the project are primarily based on research conducted in the south (Parker 1997). Due to significant differences in culture, topography, programs, and project history between the southern and northern portions of ACA and the severe security restrictions on study area selection, this research does not consider the achievements of IBPs in the southern region of ACA. It can only provide a snapshot of ACAP's achievements in the northern region, given the rapid change and impact the Maoist movement has had on ACAP's management capabilities and community-based conservation and development institutions.

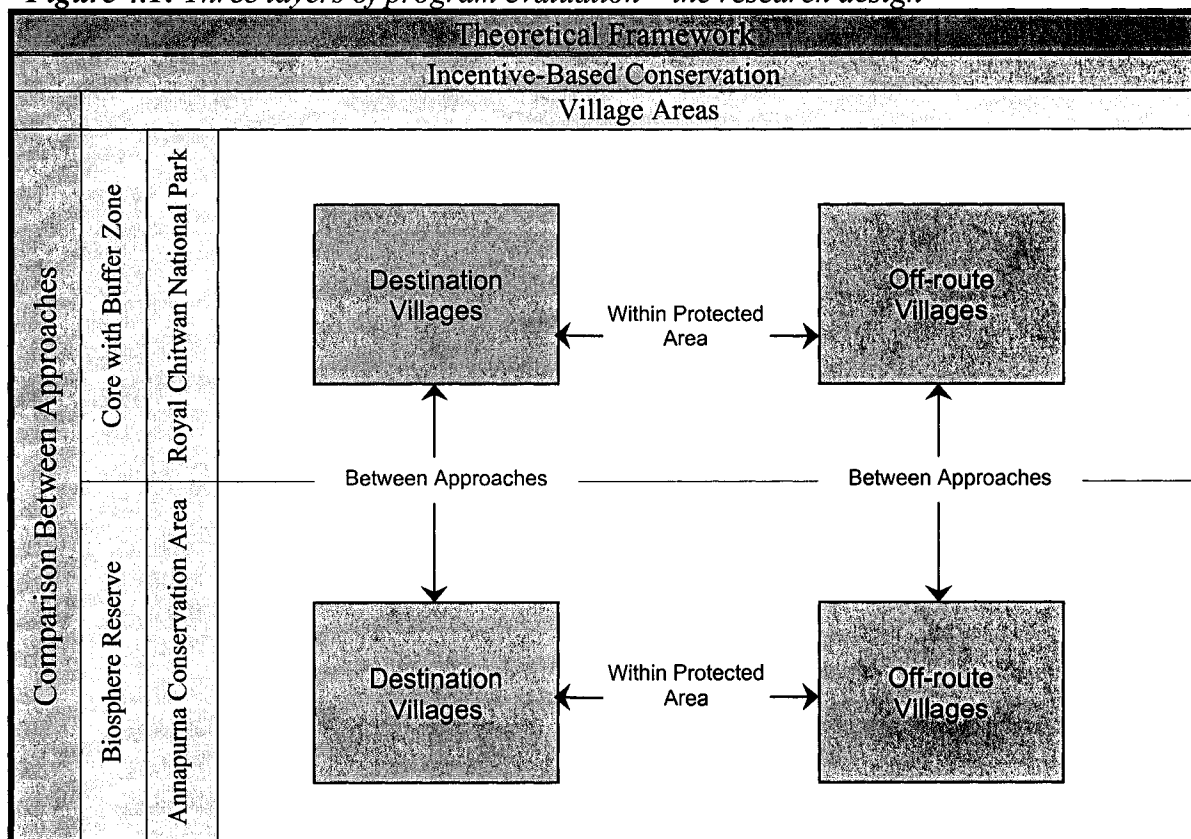
Chapter 4: Research Methodology

4.1 Research Design

The research design is based on a program evaluation. Program evaluations are effective means to understand the potential and the limits of IBPs (Conley and Moote 2003). The two major purposes of program evaluations are to determine the extent to which objectives were achieved and to identify reasons for program success and failures (York 1982). According to Conley and Moote (2003), evaluations of natural resource management can be conducted from three different angles: (1) against an organization's own goals; (2) against an ideal; and (3) against other efforts. Measuring an organization's ability to achieve its own goals for establishing incentives for conservation is an essential element for adaptive management; however, such an evaluation does not assess the "appropriateness of the goals and objectives themselves, the assumptions behind them, or the process used to define them" (Conley and Moote 2003:377). Comparing case studies of IBPs in various conservation approaches can show "how variations in processes and in both social and ecological contexts result in different outcomes" (Conley and Moote 2003:378) and can be useful for conservationists to determine the most appropriate approach for a given situation. By comparing individual approaches to the overarching theories behind IBPs, the appropriateness of organizational goals can be evaluated based on comparability to the overall paradigm.

In light of the strengths and limitations of each evaluation angle, the design of this study incorporates multi-level evaluation to examine IBPs' distribution and influence on attitudes in core / buffer zone and biosphere reserve conservation approaches in Nepal. Figure 4.1 provides a conceptual diagram of the angles of comparison in this research.

Figure 4.1: Three layers of program evaluation – the research design



Each protected area is evaluated in terms of its ability to distribute IBPs that manifest in positive attitudes toward conservation. The goals of IBPs as applied in RCNP and ACA coincide with the overarching theory behind IBPs; thus, this research involves two primary evaluation angles: (1) within protected areas; and (2) between protected areas.

The research was conducted in two protected areas in Nepal. Given the diversity of approaches to conservation represented in Nepal's extensive network of protected areas, the country offers an ideal institutional setting to examine the merits and faults of IBPs as applied in buffer zones of core protected areas and in biosphere reserves. Nepal has been the focal point of much research on conservation in developing countries (e.g., Häusler 1993; Nepal and Weber 1993; Brown 1998; Mehta and Heinen 2001; McLean and

Stræde 2003; Bajracharya et al. 2005). Nepal has identified the importance of incentive-based conservation in the principles of the country's Biodiversity Strategy, which states that the "long-term sustainable use of biological resources can only be achieved if the benefits are shared fairly and equitably" (MFSC 2002:2). The current escalating political conflict between the monarchy, the government and the insurgent communist party (Maoist) has had substantial effects on tourist arrivals to Nepal, and provides a test for the stability of incentive-based conservation programs throughout.

RCNP and ACA were chosen as study areas based on the management approach applied and the structure of the managing organizations. RCNP represents a core with buffer zone approach to conservation while ACA represents a biosphere reserve approach. Data were collected from September 2004 to December 2004 in the buffer zone of RCNP and in ACA. Tourism promotion and development are present in both protected areas and are used as an incentive to encourage conservation support from local residents. In selecting the protected areas I considered the length of time the programs have been in place, as previous research has found the life-cycle stage of a program in an area can affect local perceptions (Abbot et al. 2001; Mehta and Heinen 2001; Walpole and Goodwin 2001; Jim and Xu 2002). Despite RCNP existing for longer than ACA, the IBPs in RCNP have begun more recently and coincide with the establishment of ACA.

4.2 Sampling Design

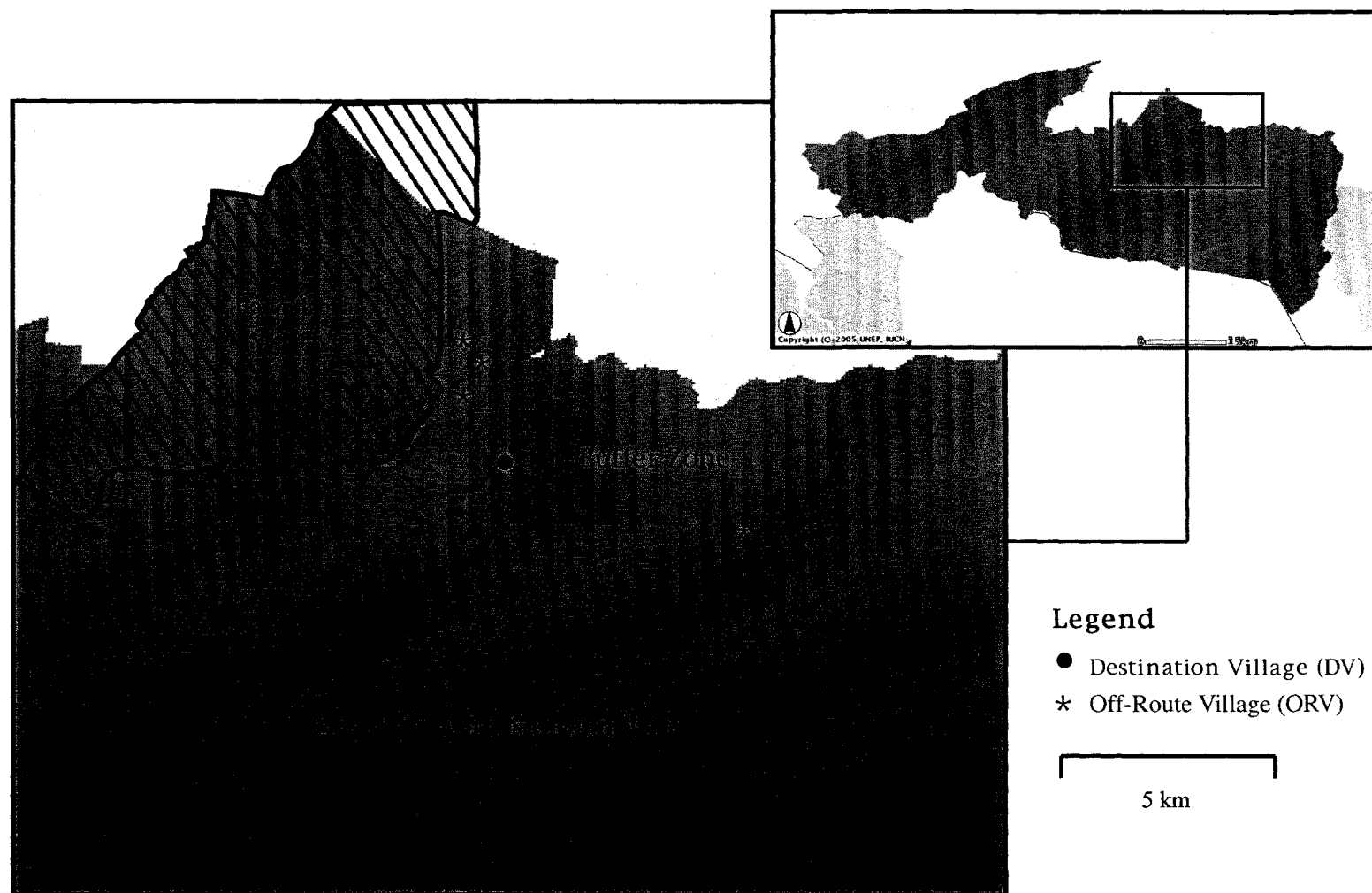
Within each conservation initiative, purposive sampling (Ward 1993) was used to select the experimental units (village areas) incorporated in this research. Considerable care was taken to ensure selected villages represented the range of culture, livelihood, and degree of development activities in the regions. Areas were selected based on the

overall concentration of incentive programs by the conservation authority in the region, and because tourism is one of the main tools used as an incentive for conservation, the presence of a tourism market was a criterion. All villages included in the RCNP study area were close to the national park; thus, conflicts between villagers and wildlife were a problem. All villages in the ACA study area were within the boundaries of the conservation area.

In RCNP, Sauraha was selected as the ‘benefiting village’ (herein referred to throughout the thesis as destination villages (DVs)), given that it is the focal point for tourist facilities and services in the Chitwan district, and is the main gateway to access the national park. In ACA, villages along the main trekking route, highlighted in promotional pamphlets printed and distributed by ACAP, were classified as DVs. In both protected areas the selection of ‘non-benefiting villages’ (herein referred to as off-route villages (ORVs)) included villages not exhibiting the characteristics of DVs. Appendix 4.1 provides a list of villages included in the study in each protected area.

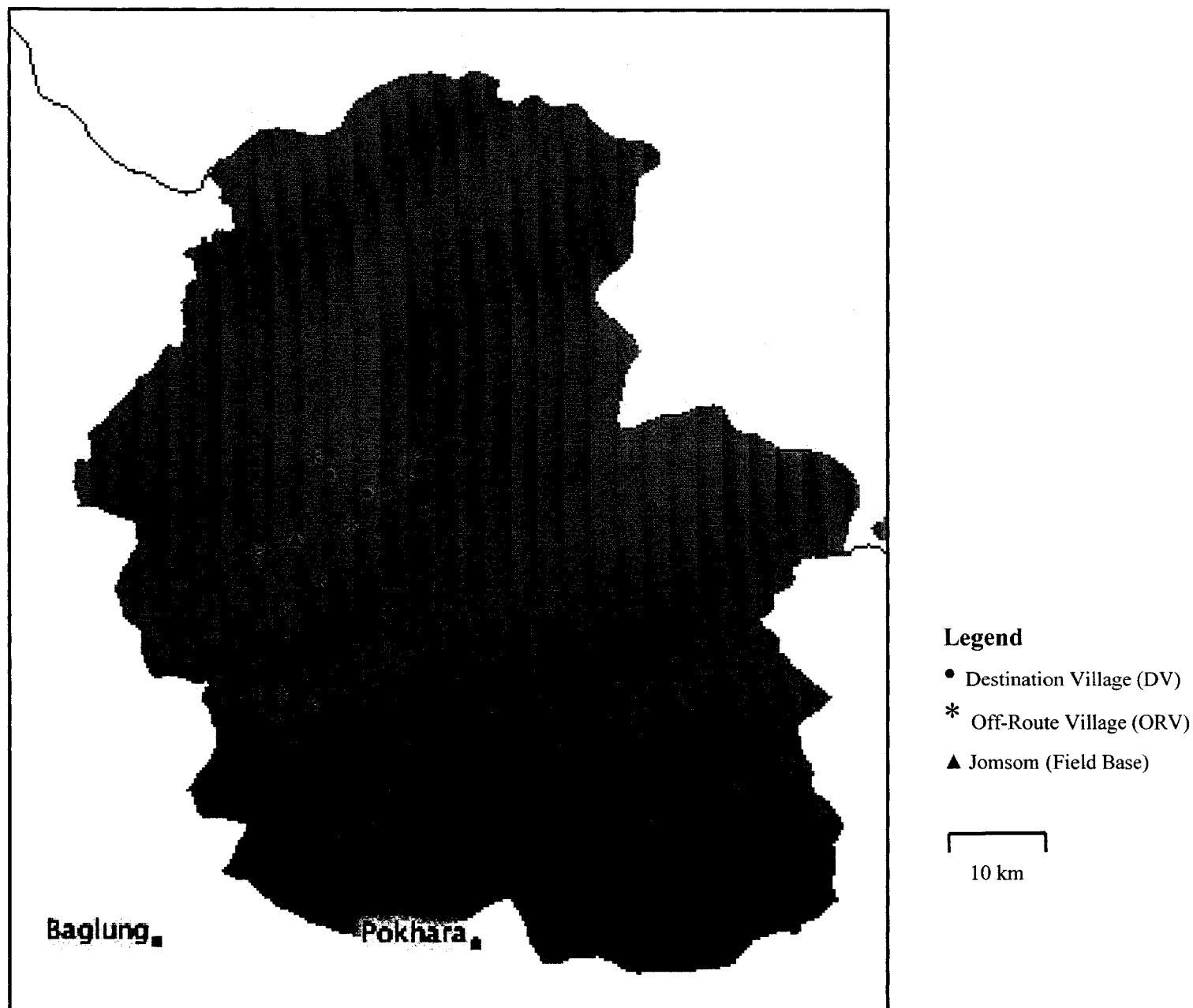
The selected villages represent areas with a concentration of development activities on the one hand (DVs), and no, or few, project-led developments or compensation for conservation losses on the other (ORVs). Additional criteria for the overall village area selection included the following: location in or near protected areas; historical reliance upon natural resources; constraints on livelihood due to conservation; and size of community. Figures 4.2 and 4.3 provide a map of the two study areas with villages included in the study labeled by category.

Figure 4.2: Map of RCNP study area and location of villages under study



Source: Adapted from WDPA 2005

Figure 4.3: Map of ACA study area and location of villages under study



Source: Adapted from WDPA 2005

4.3 Primary Research Method

This research included a mix of primary and secondary sources of data, both quantitative and qualitative. A structured interview questionnaire was the primary survey instrument used to determine perceptions of local residents within each community (Appendix 4.2). Response frequencies for all quantitative questions are presented in Appendices 4.3 to 4.8. Surveys are described as a powerful tool enabling researchers to generalize results from a small sample to the population from which it was drawn (Bulmer 1993a). A total of 377 households were surveyed (189 in RCNP; 188 in ACA), with a sampling coverage of 20 to 30% of all households residing in the sampled villages.

Questions asked respondents for information on attitudes towards conservation, participation in conservation and development committees, perception of program benefits (including distribution, equity, appropriateness), natural resource use, losses from protected wildlife, and demographic variables (gender, ethnicity, age, education, caste). Survey questions were mostly based on Likert-scale or binary category responses to allow for quantitative analysis, and some open-ended questions were also incorporated to allow respondents to offer additional information (Oppenheim 1992; Neuman 1997). Questionnaire testing conducted in ACA allowed for improvements to the translation. The questionnaire was administered during a face-to-face interview, where the research assistants or Damodar Khadka, a fellow UNBC graduate student, asked the questions and recorded responses. Questionnaires were written in Nepali, but, depending on the respondent's ethnicity, were translated into the local language by research assistants. Probes were used to assist respondents in providing complete answers to questions (Oppenheim 1992).

4.3.1 Research Team

Two research teams each consisting of two people (graduate student and assistant) administered the questionnaires. Non-sampling error stemming from the respondent or the researcher can be common in survey research in developing countries (Bulmer 1993b). Respondents can unintentionally provide misleading or false information due to cultural taboos on discussing certain topics and instrument error due to misunderstanding of concepts such as age or occupation (Bulmer 1993b). Such cross-cultural bias was minimized as one of the primary researchers in the study, Damodar Khadka, is a native of Nepal and he carefully translated the survey instrument into Nepali. To further reduce culturally based bias, efforts were made to employ research assistants from the local area, who were then trained to administer the questionnaire. Only one of the teams included a foreigner (myself), which may have affected questionnaire responses (Bulmer 1993b). Given the remote location of ACA, one of the research assistants was hired from the nearest city, Pokhara, based on his ability to speak and write English and assist me in the research.

4.3.2 Sampling Unit

The sampling unit for the research was randomly selected individual households within the purposively selected DVs and ORVs (discussed above). Random selection in developing countries can be difficult due to incomplete or inaccurate government records (Bulmer 1993c). To avoid sampling error, community informants were asked to sketch a map of the village which was then confirmed on the ground by the research team and used to randomly select households (Fiallo and Jacobson 1995). Random selection techniques involved interviewing respondents from every other household. Male or

female heads of households were selected as respondents. If the household head was not home, another adult in the house was selected. If a resident over the age of 18 was not home or did not wish to participate, the household immediately next door was selected, until a suitable respondent was available. Survey sessions avoided the interviewing of individuals in the presence of other members of the household to evade the potential for *situational opinion*, where information gathered may be different for the same respondent when surveyed in a group versus alone (Mitchell 1993).

As illustrated in Chapter 2 (see Table 2.1), ethnicity, caste and gender have been shown in previous studies to influence resident attitudes and behaviours toward conservation (Fiallo and Jacobson 1995; Nepal and Weber 1995; Mehta and Kellert 1998; Gillingham and Lee 1999; Songorwa 1999; Abbot et al. 2001; Archabald and Naughton-Treves 2001; Maikhuri et al. 2001; Mehta and Heinen 2001; Sah and Heinen 2001; Walpole and Goodwin 2001; Jim and Xu 2002; Stem et al. 2003). The representation of a diversity of ethnicities and castes was achieved through sampling of entire communities. Equal gender representation is important because women are the primary users of natural resources (Gupte 2003), yet often difficult because cultural norms typically limit their representation, especially when researchers are men (Bulmer 1993b). Research teams were comprised of one man and one woman to encourage women to participate as respondents. This approach contributed to an even gender split in the sample.

Analysis has been conducted on three levels: (1) household (individual perception of IBPs); (2) village (discrepancies between villages); and (3) institutional (strengths and weaknesses of each approach). Key variables for the analysis are respondents'

identification of *benefit distribution* (Chapter 5), *linkage*, and *attitudes* (Chapter 6) of IBPs. Although, for simplicity, the term *perception* is not consistently used throughout the presentation of this research, benefits, linkage and attitudes refer *only to local perceptions* of these three variables as measured by questionnaire surveys.

4.4 Additional Research Methods

In addition to the questionnaire survey, local perceptions were qualitatively evaluated through participant observation during informal discussions in the villages, and the researcher's observations in the field (Conley and Moote 2003). Qualitative methods also included informal guided interviews with community informants and conservation authorities, and a review of published and unpublished policies of each conservation initiative. The inclusion of these additional research methods combined the benefits of extensive coverage from survey methods with the richness and depth of information provided by qualitative methods (Bulmer 1993a).

4.4.1 Expert and Management Interviews

Informal interviews were held with conservation authorities and experts in the field in Nepal. Although these interviews were unstructured, predetermined questions were used as a guide to facilitate discussion and obtain information on IBPs in RCNP and ACA (Appendix 4.9). In total nineteen interviews were conducted with representatives from the managing organizations for each protected area (KMTNC and DNPWC), their partners (WWF-Nepal, TRPAP, etc.), and other individuals representing influential conservation and development associations.

Given the current political instability in Nepal, the government administrative units have been dissolved. When possible, past VDC chairpersons were interviewed

informally to provide further information on local conservation and development issues. In ACA, traditional village headmen were also interviewed because they still maintain informal leadership roles, especially under the current state of government dysfunction. In addition, leaders from community-based institutions developed with support from protected area authorities or in response to local conservation and development activities were interviewed to gain an understanding of their role in the community. As local leaders, they provided valuable insight into local attitudes toward the protected area authorities and conservation in general. Appendix 4.10 provides a complete list of interviews conducted with experts, protected area managers and local committee representatives; however, in order to protect anonymity, names and positions are not provided.

4.4.2 Participant Observation

Obtaining information from respondents on behaviours considered illegal by protected area authorities is difficult. Often respondents provide false information for fear of repercussions for illegal actions or in order to present a positive personal image to the researcher (Neuman 1997). In such situations, participant observations can be used to supplement data collected through survey questionnaires and interviews, and may provide information otherwise not obtainable through direct methods (Nepal and Weber 1993; Conley and Moote 2003). Although participant observation was not a significant approach taken in the methodology for this research, observations were noted down in field journals. Observations of illegal behaviour primarily support the need for concern over the sustainability of IBPs in RCNP and ACA.

4.4.3 Informal Discussions

Throughout the duration of the field research, opportunities arose to discuss issues surrounding protected area management on an informal basis with local residents (McClanahan et al. 2005). Such discussions are seen as a form of participant observation, and can provide information not covered in the questionnaire as residents are able to speak freely about their attitudes toward the protected area (Becker 1999). In some cases, villagers felt more comfortable speaking with our research team on an informal basis outside of the context of our questionnaire.

4.5 Research Context and Sources of Error

While issues affecting the reliability and validity of the research methods have been discussed throughout this chapter, the context of the research will be summarized here. The most significant factor impeding the research and resulting in potential for sampling error was the current political situation in Nepal. The political situation influenced the choice of sample villages within each protected area, thereby limiting the ability to generalize results across the entire protected area.

In ACA, the Mustang and Manang Districts were the only two districts not affected by Maoist occupation (Appendix 4.11). Both of these districts have the shortest history of ACA management by KMTNC. The southern portion of ACA, including Ghandruk, Lwang, Sikles, and Bhujung districts, were the initial districts incorporated into ACA, but have been severely affected by the Maoist insurgency. For this reason, Mustang was chosen as the study area, yet it has not experienced the same level of investment in terms of financial resources and time as the southern regions. Also, the southern regions are differentiated from the northern regions by distinct cultural and occupational differences.

As a result, this research presents an evaluation of the activities of KMTNC in the northern region of ACA. However, it should also be noted that much of the progress made through programs initiated in the southern regions of ACA have been compromised due to attacks on KMTNC field offices and staff withdrawal from the area. In addition, the activities of community-based committees in these regions have been halted to some extent. Even if the safety of the research team had not been a concern in the southern portion of ACA, including these regions in the sample would not have provided an accurate reflection of the level of success of IBPs as activities in these regions, for the most part, have been halted, and outsiders might not have been welcome.

The region surrounding RCNP is heavily affected by the Maoist insurgency (Appendix 4.11). During the field research in this area, news reports of armed confrontations between Maoists and RNA, shootings, bombings, attacks, and Maoist imposed strikes were frequent. On a trip to the park headquarters we passed a local transit bus that had been bombed the day before. Due to concerns over researcher safety, the study area chosen was in the vicinity of the main tourist gateway into the national park, Sauraha. Due to their proximity to Sauraha, ORVs included in the study benefited from the attention they received from international development agencies to the region. Although tourist hotels, restaurants and shops are not established in these areas, community forests provide recreational opportunities to tourists transported from Sauraha, and as a result, these communities indirectly capture revenue from tourism outside the dispersal of park revenue. Ideally, the research design would have included villages entirely removed from tourism activities, but this was not possible due to the political situation. Despite efforts to avoid regions where armed conflict was likely,

confrontations between the Maoists and the RNA occurred in the villages we surveyed. One village in particular, Janakpur, presented real concerns for our research team's safety. Appendix 4.12 recounts an encounter in this village between one of the research teams and the regional leaders from the Maoist party. Following this encounter we resumed our field work in this village but were aware we were being observed by Maoists. Had we chosen not to return to the village, the Maoists may have been suspicious of our activities and could have perceived the research team as 'spies' from the government, thereby threatening the future safety of our research assistants and their families living in the area.

Scheduling conflicts with livelihood activities presented another challenge to obtaining a representative sample of the population. Although our questionnaire interviews were conducted from early morning to late evening, the seasonal timing of the field research in ACA corresponded with fall harvest and precluded some people from participating in the survey. Occasionally, respondents were interviewed in their fields or meetings were rescheduled to ensure the sample included people growing crops.

Research in developing countries is prone to non-sampling error resulting from the interaction and cultural differences between the researcher and respondent (Bulmer 1993b). Although efforts were taken to minimize non-sampling error, understanding potential sources of error is essential. The political situation impacted the way residents responded to strangers entering their village and asking questions about protected area management. Specifically in ACA, respondents were very suspicious of our research team. Respondents continued to meet us with suspicion despite us meeting with community leaders and thoroughly explaining our purpose and non-partial associations to

respondents. Villagers in ACA, especially in ORVs, are not accustomed to outsiders entering their community, and are increasingly sensitive given the current fear invoked by the political situation. In ACA, respondents continued to believe we were spies from KMTNC, the army or Maoists, and fear from repercussions may have inhibited respondents from providing honest, accurate accounts of personal attitudes and perceptions of protected area management. Surprisingly, respondents in RCNP were not as suspicious as those in ACA, despite the heavier Maoist presence.

Conducting survey research in a foreign country can lead to difficulties in the accuracy of the questionnaire measurement. Back translation was used to verify the translations of the English questionnaire into Nepali by retranslating back to English; however, some loss of equivalence in the translations is inevitable (Shyamsundar and Kramer 1996; Neuman 1997). Additional losses of meaning would also have occurred when the questionnaire was translated into local dialects by the research assistant. Further translation errors may have arisen when the research assistant transcribed the response and then retranslated the response back to English (Bulmer 1993b). Some of the concepts measured by the questionnaire may represent values with a western cultural bias due to the experience of the graduate students (Neuman 1997). For example, measuring attitudes toward nature in a cross-cultural context can be difficult due to different values placed on nature and conservation by the researcher and the respondents. Such bias was minimized as one of the primary researchers was originally from Nepal. Although the survey instrument was translated into culturally appropriate language and concepts, low levels of education, especially among women and low caste respondents, led to either difficulties in understanding certain questions or non-response due to the

perception that personal opinions of uneducated people had no value (Bulmer 1993b). Also, given the length of the questionnaire, respondent fatigue may explain non-committal, 'don't know' responses. Respondents who appeared to lose interest in the interview may have been interviewed by past research teams. In both ACA and RCNP, we discovered other studies were being conducted concurrently.

Research teams consisted of one male and one female researcher to minimize the effect of social norms prohibiting the participation of women. However, one of the research teams included a foreigner, which may have led respondents to alter answers to questions in order to please the foreigner (ingratiation bias), to hide socially unacceptable behaviour (social desirability bias), or to be hospitable (courtesy bias) (Oppenheim 1992; Bulmer 1993b). In ACA, we discovered after hiring one of the research assistants that her father was chairman of the district. To minimize the impact her presence would have on people's responses for the questionnaire, she only administered questionnaires in villages where she was not known. Although every effort was made to minimize her effect, some respondents may have known of her father's position and altered responses because of perceptions of non-anonymity.

Clinical witnesses, described as third parties present during a one-on-one interview, have been shown to be a major contributor to bias in social research in developing countries, as respondents may answer questions differently in the presence of others (Mitchell 1993). The social stratification of Nepali society, the honour assigned to village leadership roles, and the status of women made interviews with people of lower social status difficult, especially in the presence of high status individuals. When third parties attempted to answer questions on behalf of the respondent, the respondent was

again asked for his or her own opinion. With two people in each research team, one researcher was able to interact with third parties to minimize their interference with the interview. Despite efforts to prevent gathering of family and friends during interviews, occasionally respondents may have not offered accurate responses to questions due to the presence of clinical witnesses.

The final potential source of error in the research design and methods concerns limitations for drawing conclusions about the differences between RCNP and ACA. The design of this research includes a case study comparison between RCNP and ACA. Case study comparative research involves comparing distinct groups, societies or cultures, but does not allow for broad generalizations (Neuman 1997). The diversity of Nepal in terms of culture and topography makes comparing RCNP and ACA equivalent to comparing different nations. Also, patterns of responses may lack contextual equivalence between the two protected areas (Neuman 1997). For example, supporting personal collection of vegetation from the park may indicate noncompliance in RCNP given the park prohibits resource collection, but in ACA, such prohibitions do not exist, and resource extraction would not indicate noncompliance with conservation. Comparisons between IBPs under the different management approaches of core zones and biosphere reserves must consider the cultural, topographical and policy differences between RCNP and ACA and avoid making broad generalizations about IBPs in Nepal.

4.6 Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 13.0. Generally, data analysis was completed separately for ACA and RCNP; however, comparative analysis was conducted to identify differences between the

protected areas. To facilitate data analysis, responses were coded for each questionnaire during the field research and were checked for transcription errors. Some open-ended responses were categorized and coded following field research. While this practice results in a loss of richness in the data, it has the benefit of allowing for unconfined responses (Oppenheim 1992; De Vaus 2002). Likert scale questions were initially coded in the order the response categories appeared on the questionnaire, but during the data entry phase, the codes were reassigned (using SPSS) so positive responses corresponded with higher numerical codes to facilitate data analysis. For example, if a question was positively constructed with response categories on a 5-point scale, 'strongly agree' would receive the score of 5. 'Don't know' responses were treated as missing because it was difficult to ascertain whether a 'don't know' response indicated indifference, a misunderstanding of the question, respondent fatigue, or a genuine 'don't know' response (Neuman 1997). Variables with a large portion of missing data were tested to determine if missing values were randomly distributed, and no significant patterns were found (Tabachnick and Fidell 1989). To identify differences between village categories, demographic variables were compared between villages within each protected area using chi-square tests of independence. If two variables represented significant differences between villages ($p < 0.05$), Cramer's V was used as a measure of association, where values range from 0 (no association) to 1 (perfect association) and provide an indication of the strength of the relationship (Appendix 4.13). Appendix 4.14 provides a list of the main variables used in analysis and Appendix 4.15 summarizes the statistical tests and relationships explored in the research.

Scales were created from multiple responses and were used to measure respondents' attitudes toward protected area authorities and linkage between livelihoods and the conservation of natural resources. To determine levels of resource dependency and perceptions of benefit receipt, responses to individual questions were summed to create composite scales. Using a single variable to measure an underlying concept overlooks other potential confounding variables, and allows for no room for error in interpretation of a question on the part of the respondent (De Vaus 2002). Scales have many advantages over using single variables in data analysis, especially if the underlying concept being identified is complex. The use of scales increases the validity, reliability and precision of measurements of the latent variable. Also, although the construction of a scale may be complex, using scales simplifies data analysis by summarizing information conveyed in a number of variables, thereby eliminating the need to conduct separate analyses for each variable (De Vaus 2002).

A number of steps were taken to produce the scales for linkage and attitude (See Appendix 4.16). Variables with positive skew (> 90%) were excluded from the analysis (De Vaus 2002). Scale components included redundancy, which is considered beneficial in highlighting the latent variable (DeVellis 1991). The first task was to ensure negatively and positively worded variables were coded in the appropriate direction. High scores were to correspond with stronger linkage and positive attitudes; therefore agreement with a positively worded statement or disagreement with a negatively worded statement received higher codes.

The next step involved determining if the individual variables included in the scales were appropriate. Variables with item-total correlations less than 0.3 were deleted from

the scales as low correlations indicate the set of variables are not unidimensional (De Vaus 2002). Cronbach's Alpha coefficient provides a measure of the overall reliability of a scale, ranging between 0 and 1 (De Vaus 2002). As the figure increases the scale becomes more reliable or consistent. Typically a value of 0.7 or higher indicates a reliable scale; however, values of 0.65 or higher can be considered acceptable (DeVellis 1991, cf. accepted values of 0.63, 0.68 and 0.69 in Mehta and Kellert 1998, 0.61 in Walpole and Goodwin 2001, 0.51 in Sah and Heinen 2001). Alpha coefficients were calculated for both scales for ACA and RCNP separately, and together. Combination scales for both protected areas together allowed for direct comparisons between scale scores, while separate scales for within protected area analysis improved the internal consistency of the scale as a measure of the latent variable.

For computing scales and composite variables, missing values were replaced with the group mean based on a 30% maximum number of missing values per case. Without such treatment of missing values, cases would be unnecessarily excluded from analysis due to 'don't know' responses, resulting in the exclusion of an impractically large portion of respondents (Manly 2004). The group mean is considered the best estimate available to replace missing values, and by setting a limit on the maximum number of missing variables allowed per case, the extent of variance loss within the sample from replacing with mean is minimized (Tabachnick and Fidell 1989). Individual variable scores were summed to arrive at the total scale scores for linkage and attitude. Finally, the scale scores were transformed to fit a range from zero to ten. Although the components of the final scale were initially in an ordinal form, when summed the convention is to treat the new scale as interval because such treatment allows for more sophisticated and powerful

statistical tests (De Vaus 2002). Following this convention, scale scores were treated as interval variables when entered as predictors in logistic regression, and were visually presented in bar graphs measuring scale means to highlight differences between groups. All scale scores were also transformed into dichotomous variables reflecting high and low values by group means to allow for logistic regression analysis with the scale as the dependent variable.

Tests for normality of distributions were conducted on all data. Violations of normality assumptions negated the use of parametric statistics; hence, non-parametric alternatives were used instead. Normality was assessed to determine the suitability of data for use in multiple regression; however, because the data were not normally distributed, multivariate comparisons based on demographic predictor variables used logistic regression.

The demographic variables entered into logistic regression required transformation in order to simplify data analysis (De Vaus 2002). Gender and resident status were already in an appropriate form for regression analysis; however, the remaining predictor variables had to be transformed from their nominal measure as categories into dichotomous variables. Earnings on an absolute scale provide an incomplete measure of wealth in developing countries; hence a respondent's economic status was determined based on their stated difficulty at meeting their subsistence needs (after Mehta and Heinen 2001). Respondents reporting the ability to cover basic household expenditures (food and clothing) with their current level of annual income were classified as wealthy (1), while those facing difficulties supporting such expenditures were classed as poor (0). Education and age were recoded to create two dichotomous variables to reflect low levels

(0, primary or less) and high levels of education (1, more than primary), and younger (0, < 45 years old) and older (1, > 45 years old) respondents, respectively. Such collapsing of many categories into only two categories results in a loss of information but is the simplest way of including these variables in the analysis (De Vaus 2002). Occupation and caste were originally collected as responses to open-ended questions, which were then coded to create ordinal variables to facilitate analysis. These variables were collapsed due to limited frequency counts in certain categories. Creating dichotomous categories from these two variables would result in a loss of important differences between groups. To avoid such losses occupation and caste were converted into dummy variables (De Vaus 2002). Occupation was a three-category variable (domestic work and agriculture, tourism, other) and is represented by two dummy variables and by omitting one category (other). Domestic work and agriculture were combined due to an overlap of responsibilities, as the same type of work could have been referred to by a respondent through either category. Ordered ranking of castes is embedded in the social structure of Nepali society; however, for the purposes of this research, caste was treated as a three-category nominal variable. Two dummy variables were created to represent caste. In ACA middle castes were the omitted category, and in RCNP high castes were the omitted category.

4.6.1 Benefits

Benefits, as presented throughout this research, represent respondents' *perceptions* of benefit receipt overall and benefit receipt from tourism. Responses from two questions regarding perceptions of benefit receipt were summed to create a composite scale reflecting a household's receipt of benefits from the protection of natural resources and

conservation-related development activities. Each question listed four categories of benefit levels including none (0), little (1), some (2), or most (3). Cases with missing values and 'don't know' responses were excluded from the analysis due to the limited number of variables comprising the composite scale. The scores were transformed to fit a zero to 10 scale, with 10 indicating the highest level of benefit (De Vaus 2002). Non-parametric bivariate Mann-Whitney U tests were performed to determine the relationship between protected area and perception of benefits. The composite scale score was then transformed into a dichotomous variable by creating two categories of benefits (few, many) by the group median. Logistic regression was used to identify demographic variables relating to perceptions of benefit receipt.

To determine what local residents perceived as the benefits from the protected area, respondents were asked to provide a list of benefits received by their household and their community from the protection of natural resources and development projects. Respondents were free to list any benefits they recognized and were not confined to predetermined benefits listed on the questionnaire. Qualitative responses were then grouped into six main categories of benefits: economic, social development, extraction, conservation, mitigation, and participation (Appendix 4.17 provides a breakdown of each category). Benefit categories identified were compared within and between protected areas using chi-square tests of significance ($p < 0.05$) and Cramer's V measure of association.

Two statements from the questionnaire were used to determine if respondents perceived benefits from tourism: (1) my family has more money due to tourism, and (2) tourism benefits my family. Respondents who gave positive responses to either question

were considered to perceive benefits from tourism. Tourism benefit was broken down into direct and indirect benefits based on employment in the tourism industry by at least one member of the household (direct). The following occupations were classified as constituting tourism employment: hotel owner or employee, tourist restaurant owner or employee, tourist shop owner, travel agent, and foreign currency exchange business owner. Chi-square tests of independence ($p < 0.05$) were used to compare village and protected area to tourism benefit, with Cramer's V used as a measure of association if significant relationships were found. Given tourism is the primary source of IBP funding in RCNP and ACA, relationships between type of tourism benefit and scale scores (benefit, linkage, attitude) were examined using Kruskal-Wallis tests. Bar graphs comparing means by tourism benefit for each of these scales were used to visually illustrate these relationships.

4.6.2 Costs

Costs presented throughout this research are based on an individual's perceptions and not actual documented reports of costs. To determine the main problems faced in each protected area, respondents were asked their experience of costs from a list of predetermined issues identified in the literature. To allow for chi-square tests of independence between costs and village categories, the Likert scale was condensed into two categories to increase expected counts. The new category indicated whether respondents experienced a problem (1) or did not experience a problem (0). Again, chi-square tests were used to identify differences significant in the population ($p < 0.05$) and Cramer's V was used as a measure of association.

The reported numbers of wildlife species responsible for crop damage and livestock depredation were used as a measure of wildlife costs to determine whether differences in costs exist based on specific independent variables (after de Boer and Baquete 1998). Although respondents provided estimated economic valuations of crop and livestock loss, a respondent's own identification of a value for losses has been found to be overestimated or exaggerated based on the expectation of compensation (Nepal and Weber 1993). Also, for many subsistence farmers, assigning monetary value to crops or livestock intended for household use proves difficult and quantifying losses depends on respondent recall timelines (Neuman 1997; de Boer and Baquete 1998). The identification of offending wild animals provides the best measure in offering an indication of the size of loss because respondents with more crops or livestock suffer more consequences as a result of the protected area. However, because of inherent differences in wildlife species in each protected area, and corresponding differences in the severity of damage caused by each species across protected areas, the number of species named responsible can not be used for comparisons between protected areas. Instead, experiences of crop loss and livestock depredation were used to compare wildlife damages between protected areas using chi-square tests, with Cramer's V as a measure of association.

Resource dependency was calculated based on the respondent's own weighted indication of their current use of specific resources and their desire to use specific resources. Respondents were asked questions regarding current level of use within the protected area from a list of resources. Each question listed five types of resources and respondents could indicate their level of use or need based on none (0), some (1), or lots (2). Next, respondents were asked if they wished to have further access to resources

within the protected area, and if so, were requested to indicate categories and rate of access needed for resources desired. These responses were analyzed using cross-tabulation tables for bivariate relationships with village category for each type of resource, and then weighted responses were totaled for all resources to arrive at a composite score indicative of current total resource use and total desire for resources. These scores were summed and transformed to fit a zero to 10 scale, with 10 indicating the highest level of resource dependency. Mann-Whitney U tests were used for comparisons of resource dependency between protected areas.

Wildlife costs (crop loss and livestock depredation) and resource dependency scale scores were treated as dependent variables and first were subjected to bivariate analysis comparing distributions between villages using Mann-Whitney U tests to provide an indication of the zero-order relationship (De Vaus 2002). Multivariate analysis compared these dependent variables to multiple predictor variables using logistic regression, with $p < 0.05$ significance level. To facilitate this analysis, the variable had to be transformed into a dichotomous variable. The number of wildlife species named responsible for crop damage was divided into two groups (few wildlife species, many wildlife species) by the group mean. The same transformation was conducted for livestock loss and resource dependency. The predictor variables entered into the logistic regression analyses were: village category, gender, respondent's resident status (native or immigrant), wealth, education, age, occupation, and caste.

4.6.3 Distribution

Benefit distribution was evaluated based on the relationship between costs and perceptions of benefit receipt. The dichotomous variable for benefit receipt was used in a

simple logistic regression to identify the relationship between each of the cost measures (number of wildlife species responsible for crop loss and livestock depredation, and resource dependency) and perception of benefits received. Hierarchical logistic regression was used to explore the significant relationships identified and determine the effect of village on the relationship. Village was considered an important demographic variable in the analysis given the research design and the varying perceptions of costs and benefits between DVs and ORVs. Once the effect of village was determined, a third block was entered to explore potential relationships between the non-significant costs and benefit distribution with the effect of village controlled. Relationships between type of tourism benefit and overall perceptions of benefit receipt were explored using Kruskal-Wallis tests.

4.6.4 Attitude

When measuring attitudes, it is important to make a distinction among attitudes toward nature, attitudes toward the protected area, and attitudes toward the protected area authority (Van Den Born et al. 2001). Attitudes toward nature and the protected area in general were analyzed using frequency distributions and cross-tabulation. Chi-square tests and Cramer's V were used to determine associations between village and attitudes. Responses to statements regarding a respondent's relationship with the protected area authorities were combined in a scale and used in logistic regression to identify associations between attitude toward park management scores, perceptions of linkage and perceptions of benefit. Missing values were replaced with the group mean when the maximum number of missing variable responses per case was equal to or less than two. Twenty-three cases were excluded from the analysis in ACA as the cases had missing

values for more than 30% of the variables included in the scale. Tests revealed no patterns in the missing values based on demographic variables; yet, the excluded cases could represent respondents with negative attitudes who chose not to respond to attitude questions. Alpha values were 0.81 (RCNP), 0.66 (ACA), and 0.78 (Both) for the final attitude scale, and no item-total correlation fell below 0.3 (Appendix 4.18).

To facilitate logistic regression, the scale score for attitude towards protected area management was transformed into a dichotomous variable based on the group mean. This variable was used in a simple logistic regression to identify the relationship between perceptions of benefit and attitude. Hierarchical logistic regression was used to further explore how a perception of a link between livelihood and conservation influenced the relationship between attitudes and benefits. Relationships were identified between type of tourism benefit and attitude scores using Kruskal-Wallis and Mann-Whitney U tests. Mann-Whitney U tests facilitated comparisons of attitude scale scores between protected areas.

4.6.5 Linkage

Linkage refers to the *perceived* connection on the part of the respondent between their livelihood and conservation. Salafsky and Wollenberg (2000) suggest the presence of a perceived linkage can be determined by asking the question: “If the biodiversity of the site were to be damaged, what would happen to your livelihood activity?” This question was included in the questionnaire as a measure of linkage, but given the ambiguity in translating *biodiversity*, respondents were asked “If the resources of the protected area were damaged, what would happen to your livelihood activity?” Although this measure alone can provide a good indication of the linkage perceived by local residents, linkage is

a complicated perception to measure; as a result, this question was combined with other questions to form an overall linkage scale. The individual variables included in the initial linkage scale development stage were chosen based on their perceived ability to measure the underlying latent construct (DeVellis 1991).

A number of steps were taken to produce the scale for linkage. The final scale for both protected areas included six variables, so missing values were replaced with the group mean if a case was missing only two or less variable responses. Because the variables included in the scale had different numbers of categories, the scores for each variable had to be adjusted to ensure each item contributed equally to the final scale score (De Vaus 2002). Variable scores were adjusted by dividing a respondent's score on each scale item by the standard deviation of that item. For the final linkage scales for RCNP, ACA, and both protected areas together, alpha values were 0.67, 0.72 and 0.72, respectively, and no item-total correlation fell below 0.3 (Appendix 4.19). The summed scale scores were transformed into a dichotomous variable reflecting high linkage (1) and low linkage (0) based on the group mean. Logistic regression was used to identify the relationship between linkage scores and benefit. Bivariate statistics, including Mann-Whitney U and Krustal Wallis tests, were used to identify relationships between type of tourism benefit and linkage scale scores. Mann-Whitney U tests were used to identify differences between protected areas.

4.7 Demographic Characteristics

Appendix 4.20 provides a summary profile of the respondents in RCNP and ACA.

4.7.1 Royal Chitwan National Park

A total of 189 respondents were interviewed for the questionnaire survey, with 108 from ORVs and 81 from DVs. The gender breakdown was 59% women and 41% men in ORVs and 37% women and 63% men in DVs. The most represented age group in each village was 25 to 45 years old (52% and 64% in ORVs and DVs, respectively), with 17% (ORVs) and 16% (DVs) young respondents (18 to 24 years old), 28% (ORVs) and 16% (DVs) between 46 and 64 years old, and 4% of each village were classified as old (over 65 years). Almost half of respondents (45%) in ORVs and a quarter (25%) of DVs had no formal education. The levels of education of respondents were: 19% (ORVs) and 12% (DVs) had completed primary education, 15% and 14% in ORVs and DVs, respectively completed lower secondary education, 19% (ORVs) and 21% (DVs) completed secondary school, and 3% and 28% attended university in ORVs and DVs, respectively.

Three quarters of the respondents in DVs (73%) were born in the park or buffer zone, while only 54% in ORVs were natives to the area. The main caste in both villages was traders (middle caste), largely due the significant population of indigenous Tharu. Agriculture is the main livelihood activity in ORVs (69%), and while tourism accounts for no occupations of respondents in ORV, in DVs tourism is the main occupation of 58% of the population. Landless respondents represented only 7% of the sample in ORVs and 14% in DVs. The higher percentage in DVs is due to the shift in livelihood activity to a market-based economy rather than subsistence agriculture.

4.7.2 Annapurna Conservation Area

A total of 188 respondents were interviewed for the questionnaire survey, with 85 from ORVs and 103 from DVs. The gender breakdown was 45% women and 55% men in ORVs and equal representation of gender in DVs. The most represented age group in each village was 25 to 45 years old (46% and 50% in ORVs and DVs, respectively), with 17% (ORVs) and 8% (DVs) young respondents (18 to 24 years old), 27% (ORVs) and 39% (DVs) between 46 and 64 years old, and 11% (ORVs) and 4% (DVs) were classified as old (over 65 years). A third of the respondents had no formal education (39% and 31% in ORVs and DVs, respectively), while 29% (ORVs) and 27% (DVs) had completed primary education, 15% and 13% in ORVs and DVs, respectively completed lower secondary education, 17% (ORVs) and 25% (DVs) completed secondary school, and 13% attended university in DVs only.

The majority of respondents were born in the region now encompassed by the conservation area (85% and 84% in ORVs and DVs, respectively). The main caste group in both villages was traders (middle caste), with significantly more low caste respondents in ORVs (35%) and high caste respondents in DVs (13%). Agriculture is the main livelihood activity in ORVs (66%), and while tourism accounts for no occupations of respondents in ORVs, in DVs tourism is the main occupation of 49% of the population. Landless respondents represented only 14% of the sample in ORVs and 22% in DVs. Again, the higher percentage in DVs is due to the shift in livelihood activity to a market-based economy rather than subsistence agriculture.

Chapter 5: Results - Perceptions of Benefits and Costs

5.1 Introduction

This chapter examines the distribution of benefits in the buffer zone of RCNP and within ACA. First, the benefits as identified by local people are reviewed, providing an indication of local recognition of IBPs. Next, in order to determine appropriate target beneficiaries, individuals who experience the greatest costs are identified. The types of costs experienced in each protected area are reviewed, followed by a detailed examination of the most substantial problems faced by local people, and an identification of those experiencing the greatest costs. Finally, individual perceptions of personal receipt of benefits are examined to determine if distribution coincides with conservation burdens.

5.2 Royal Chitwan National Park

5.2.1 Benefit Identification and Distribution by Demographic Characteristics

Developing a program centered on the use of incentives to generate conservation support depends on the identification of programs and projects as benefits by the local community. Without recognition, efforts to create incentives for conservation simply go unnoticed and waste program resources. Among the answers given to the open-ended question “Do you see a need for the park to exist”, 82% of respondents suggest the park benefits local people (Table 5.1). Further open-ended questions asked respondents to list types of benefits from the park to themselves and their community. Respondents were also asked to classify their level of benefit from resource protection and development activities. Economic opportunities, social development programs, provision of resources

for extraction, intrinsic values for resource protection, livelihood protection through mitigation, and perks from participation in conservation and development were among the benefits listed from RCNP (Table 5.2). The benefits identified by individuals were grouped into categories as summarized in Appendix 4.17.

Table 5.1: Reasons given in support of RCNP's existence^a (Q#32)^b

Because of...	Total	Villages		χ^2	df	p	Cramer's V
		Destination	Off-Route				
Our benefit	81.5%	82.7%	80.6%	0.036	1	0.850	-
Plants	60.3	38.3	76.9	27.194	1	0.000	0.390 ^d
Protect resources for use	48.7	23.5	67.6	34.345	1	0.000	0.437 ^d
Wildlife	39.2	51.9	29.6	8.684	1	0.003	0.225 ^c
Tourism	32.8	60.5	12.0	47.130	1	0.000	0.511 ^c
Protect natural processes	7.9	6.2	9.3	0.255	1	0.614	-
Our future	5.3	6.2	4.6	-	-	-	-
Other developments for us	2.6	1.2	3.7	-	-	-	-
Scenery	2.6	3.7	1.9	-	-	-	-
Other revenue	0.5	1.2	0	-	-	-	-
No reason given	9.0	9.9	8.3	0.012	1	0.912	-
Total respondents	189	81	108				

^aBased on answers provided to open-ended question "Do you see a need for the park to exist". Answers categorized and coded to allow for quantitative analysis. Percentage based on total number of respondents including those who gave no response. Percentages do not equal 100% because people were allowed to provide more than one response. Chi-square test results not provided when more than 20% of cells have expected cell frequencies less than 5. ^bQ# refers to specific questions used from the questionnaire (Appendix 4.2) to create tables and figures. Cramer's V values only provided for significant relationships. Associations indicated by Cramer's V: ^clow, ^dmoderate, ^esubstantial.

Economic Benefits

For the majority of villages surrounding RCNP, agriculture is the primary economic activity; however, the tourism industry has grown in the study area and has become the major economic activity in Sauraha, the gateway village (DV) to the national park. Household economic benefits from the park were identified by 56% of respondents in RCNP; however, only 44% of respondents in ORVs mentioned receiving economic

benefits, significantly different from 70% of DVs (Table 5.2). Economic benefits were recognized at the community level by 76% of respondents overall with significant differences between villages (DVs 84%, ORVs 70%). Improvements to transportation corridors through road building and repairs were the most commonly recognized economic benefit by ORVs, as the road provides the communities with access to markets and job opportunities. DVs did recognize transportation improvements as a community benefit, but personal household economic benefits derived primarily through income from business opportunities and employment.

Table 5.2: *Benefits identified by respondents for household and community, RCNP (Q#64, 67)*

Benefits	Total	Villages		χ^2	df	p	Cramer's V
		Destination	Off-Route				
<u>Total Household</u>							
Economic	55.6%	70.4%	44.4%	11.572	1	0.001	0.258 ^a
Social Development	33.9	48.1	23.1	11.825	1	0.001	0.261 ^a
Extraction	63.5	43.2	78.7	23.648	1	0.000	0.365 ^b
Conservation	15.3	13.6	16.7	0.143	1	0.705	-
Mitigation	5.3	2.5	7.4	-	-	-	-
Participation	11.6	12.3	11.1	0.001	1	0.974	-
<u>Total Community</u>							
Economic	76.2	84.0	70.4	3.987	1	0.046	0.158 ^a
Social Development	45.5	55.6	38.0	5.089	1	0.024	0.175 ^a
Extraction	72.0	45.7	91.7	46.259	1	0.000	0.507 ^c
Conservation	18.5	25.9	13.0	4.331	1	0.037	0.165 ^a
Mitigation	8.5	7.4	9.3	0.036	1	0.850	-
Participation	7.9	7.4	8.3	0.000	1	1.000	-
N	189	81	108				

Percentage based on total number of respondents including those who gave no response. Percentages do not equal 100% because people allowed to provide more than one response. Chi-square test results not provided when more than 20% of cells have expected cell frequencies less than 5. Cramer's V values only provide for significant relationships. Associations indicated by Cramer's V: ^alow, ^bmoderate, ^csubstantial.

Overall, 62% of respondents perceive benefits from tourism (Table 5.3). Of those recognizing tourism benefits only 53% had a household member directly employed in

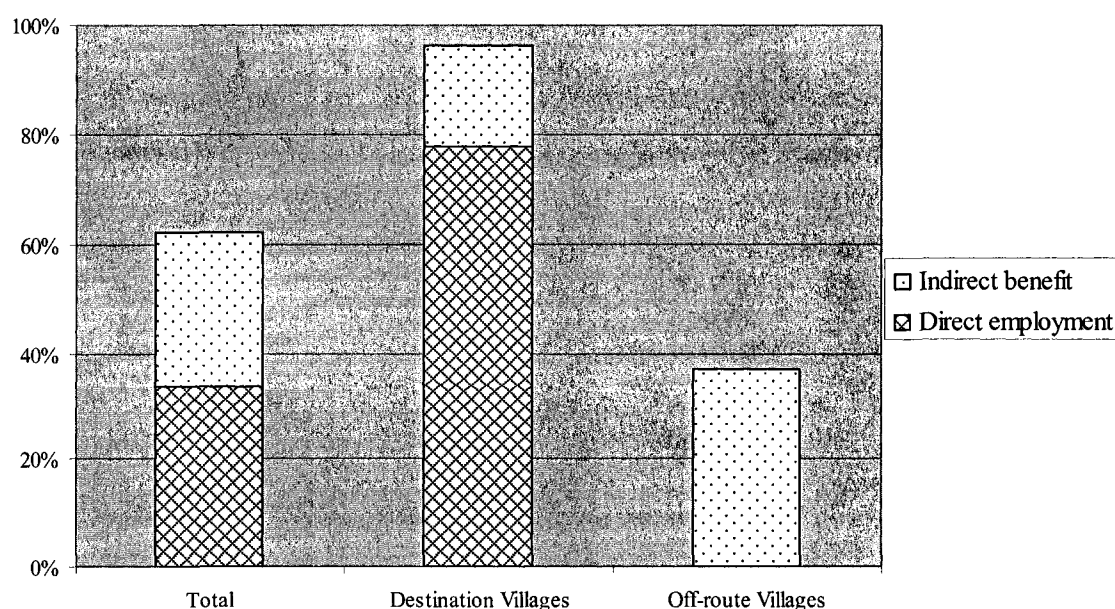
tourism services (Figure 5.1). Thus, the remaining 47% recognized indirect benefits from tourism. Chi-square tests and Cramer's V revealed strong associations between tourism benefits and village. Overall, significantly more households in DVs perceive benefits from tourism than in ORVs, and more households have at least one person employed in the tourism industry. Therefore, of the people recognizing benefits from tourism, ORV residents were more likely to recognize indirect benefits than in DVs.

Table 5.3: Respondents perceiving benefits from tourism (direct and indirect), RCNP(Q#3, 76G, I)

	Villages			χ^2	df	p	Cramer's V
	Total	Destination	Off-route				
Tourism benefits	62.4%	96.3%	37.0%	65.968	1	0.000	0.603 ^c
Direct employment ^a	53.4	80.8	0.0	66.107	1	0.000	0.766 ^d
Indirect benefit ^a	46.6	19.2	100.0				
N	188	81	107 ^b				

^aExpressed as a percentage of people perceiving benefits from tourism. ^bOne case missing. Associations indicated by Cramer's V: ^csubstantial, ^dvery strong.

Figure 5.1: Perceptions of tourism benefit receipt, RCNP (Q#3, 76G, I)



Social Development Benefits

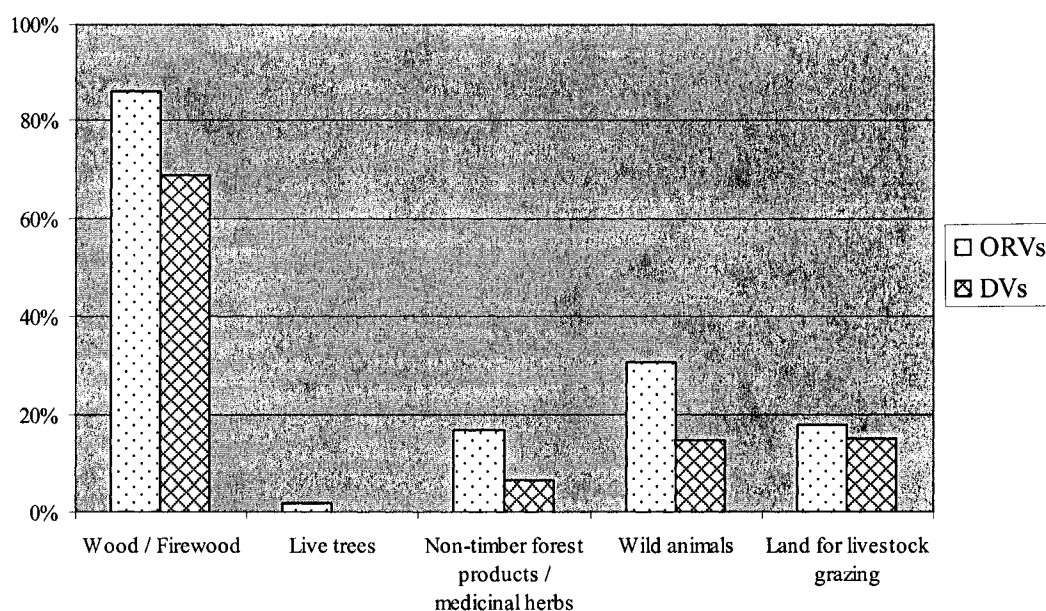
Social development benefits are the main method used under IBPs to distribute economic returns from park tourism to those not directly employed in tourism services, and living in villages off the main tourist routes (Western 1994a; Archabald and Naughton-Treves 2001). However, household benefits from social development were only identified by 34% of respondents. Significant differences existed between villages, with 23% and 48% of respondents from ORVs and DVs, respectively, identifying their household as a recipient of social development benefits. Community benefits from social development were more identifiable, with 46% of respondents indicating their community benefits from such programs. Again, these benefits were recognized significantly more in DVs than ORVs. In both villages, the main social development benefits identified were sanitation management through organized village cleanup, garbage control and toilet construction.

Extraction Benefits

Firewood, grass for house construction and plants for livestock fodder are necessary for subsistence by the majority of residents surrounding RCNP, and are the most frequently identified benefit resulting from the park. Occasional use of the park as a source of wood is currently indicated by 78%, live trees by 1%, non-timber forest products / medicinal herbs by 12%, fish and animals by 24%, and livestock grazing by 11% (Figure 5.2). Firewood is the main resource harvested from the park. Despite having restricted access, 64% of respondents still recognize access to resources for extraction as a benefit. The provision of resources for use was a major benefit identified for households (79%) and the community (92%) in ORVs, with a significant difference

when compared to DVs (43%, 46%, respectively, see Table 5.2). Residents in both villages perceive the availability of wood, grass and fodder as benefits to their household and their community.

Figure 5.2: Current resource use, RCNP (Q#54)



Conservation Benefits

Responses were classified as ‘conservation benefits’ if the respondent suggested the protection of natural resources as a benefit without indicating protection for personal use. Responses included aesthetic and recreational benefits, opportunities to view wildlife, preservation for future generations, or general forest conservation (Appendix 4.17). Only 15% of respondents indicated household conservation benefits, while 19% recognized conservation benefits received by their community. The identification of community conservation benefits was significantly higher in DVs (26%) than in ORVs (13%, see Table 5.2). Forest conservation and reforestation were mentioned most frequently as conservation benefits in DVs.

Mitigation Benefits

The category for mitigation benefits includes efforts on the part of park management to directly reduce crop, livestock or property losses. Such efforts include direct compensation or protection from wildlife damage to crops, livestock or property, protection from erosion and floods, and support for persistence of natural processes. Few respondents recognize household or community benefits under this category (5% and 9% respectively). Such results indicate little is perceived as being done to directly reduce the impact park policies have on local residents.

Participation Benefits

Participation is considered as a precursor to successful IBPs, with the purpose of ensuring programs meet local needs, address local concerns, and make local people active partners in conservation efforts. Half of the respondents in RCNP participate in conservation or development committees, yet, despite the importance placed on participation in the conservation literature, only 12% recognize household benefits and 8% community benefits from participation. Participation benefits include involvement with community support groups and lending agencies and increased awareness of conservation issues through education.

Perceptions of Benefit Receipt

The odds of respondents from DVs reporting high perceptions of benefit receipt are 4.5 times greater than in ORVs, all other factors being equal (Table 5.4). No other demographic variables contributed to the variation in perceptions of benefit receipt. A significant relationship was revealed between the levels of overall benefit received and type of tourism benefit (none, indirect, direct) indicated. Figure 5.3 provides a visual

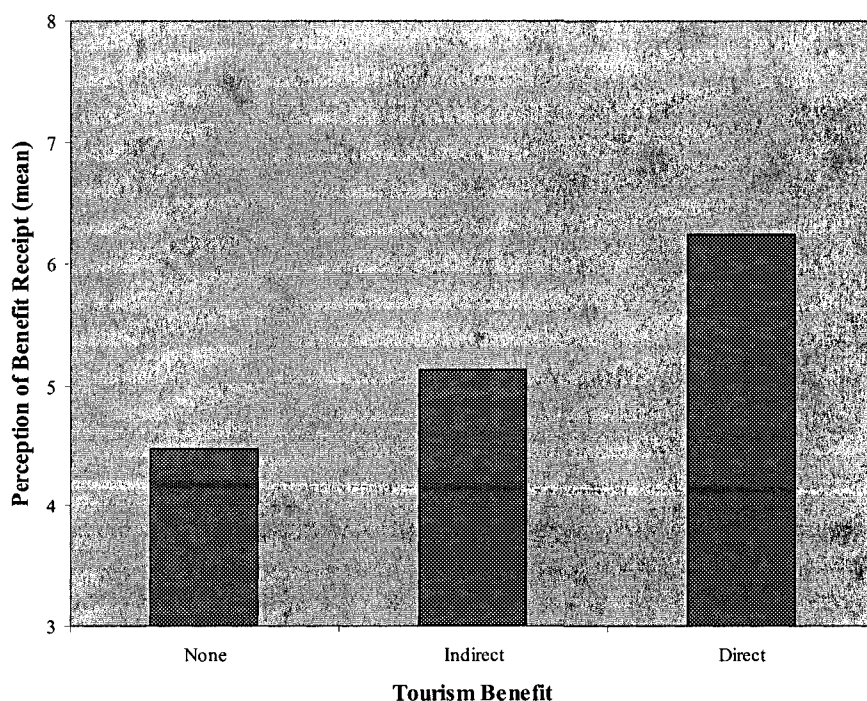
representation of this relationship showing benefit perceptions increase as involvement in the tourism industry becomes more direct.

Table 5.4: Results of logistic regression between demographic variables and perceptions of benefit receipt, RCNP (Q#1, 2, 3, 5, 30, 63A, 66A)

Socio-economic variables	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>Odds ratio*</i>
Village Category (DVs)	1.51	0.47	10.49	0.001	4.52
Gender (Women)	0.03	0.41	0.00	0.952	1.03
Origin (Migrant)	-0.34	0.39	0.79	0.374	0.71
Wealth	0.15	0.55	0.07	0.785	1.16
Education	0.60	0.41	2.12	0.145	1.82
Age	0.17	0.45	0.15	0.704	1.19
Occupation 1 (Domestic or Agriculture)	-0.98	0.71	1.90	0.168	0.38
Occupation 2 (Tourism)	-0.19	0.85	0.05	0.820	0.82
Caste 1 (Low)	0.16	0.65	0.06	0.811	1.17
Caste 2 (Mid)	0.86	0.44	3.79	0.051	2.37
Nagelkerke R Square					
	0.34				
N					
	180				
Missing cases					
	9				

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 71.1%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

Figure 5.3: Perception of benefit receipt by tourism benefit, RCNP (Q#3, 63A, 66A, 76G, I)



Results of Kruskal-Wallis show differences are significant ($\chi^2 = 24.568$, $df = 2$, $p < 0.0001$).

5.2.2 Costs

Costs associated with the national park are reported by 41% of respondents around RCNP. Differences in costs between villages are significant, with problems reported by half of ORVs (49%), and a third of DVs (31%). Wildlife related threats are by far the greatest concern of villagers (Table 5.5). Almost all residents in ORVs (98%) and DVs (93%) report damage caused by wildlife as a major problem, while the second most widespread concern is over threats to human safety (89% and 86%, respectively).

For ORVs, restrictions on access to resources were equally concerning (88%) and present a significantly greater problem than for DVs (59%). Restrictions on livestock grazing areas and an inability to meet subsistence needs were reported more often as problems resulting from the park in ORVs. Respondents in both categories of villages indicate an increased cost of living associated with the park (DVs 75%; ORVs 63%). Since threats to crops and livestock from wildlife, and restrictions on access to resources are the main problems identified by respondents, these issues are examined further and used as an indication of who experiences the most consequences from the park's existence to evaluate benefit distribution later in the chapter.

Crop Damage

Crop damage from wildlife protected in parks presents a substantial problem for residents of park buffer zones in developing countries. Crops are grown by 85% of respondents in RCNP. Agriculture is a primary activity especially for ORV residents with 99% growing crops, while in DVs only 67% of respondents grow crops. Farmers grow on average three varieties of crops with rice, maize, mustard, and lentil the most common. Damages to crops caused by wildlife are experienced by 90% of farmers in

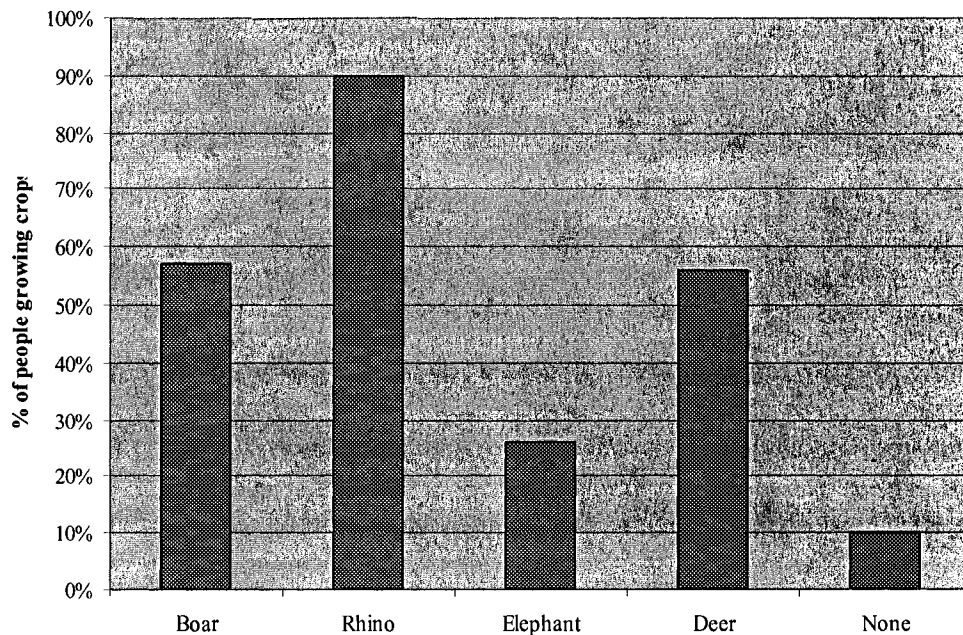
Table 5.5: Conservation costs, RCNP (Q#50, 51)

Problems	Total	Villages		χ^2	df	p	Cramer's V
		Destination	Off-Route				
Experience some costs (n = 188)	41.0%	30.9%	48.6%	5.285	1	0.022	0.179 ^b
Damages caused by wild animals (n = 189) ^a	95.8	92.6	98.1	-	-	-	-
Confrontations with conservation authorities (n = 176) ^a	46.6	39.0	52.5	2.681	1	0.102	-
Threats to human safety (n = 188) ^a	87.8	86.4	88.8	0.070	1	0.791	-
Restrictions on access to resources (n = 188) ^a	75.5	58.8	88.0	19.670	1	0.000	0.336 ^c
Restrictions on livestock grazing areas (n = 187) ^a	61.5	42.0	76.4	21.568	1	0.000	0.351 ^c
Inability to meet subsistence needs (n = 185) ^a	40.5	27.2	51.0	9.736	1	0.002	0.241 ^b
Decline in cultural values (n = 169) ^a	34.9	31.6	39.2	0.752	1	0.386	-
Loss of economic opportunities from the sale of natural resources (n = 141) ^a	20.6	15.4	25.0	1.438	1	0.230	-
Increased costs of living (n = 185) ^a	68.1	74.7	63.2	2.242	1	0.134	-
N	189	81	108				

Percentages based on total number of respondents excluding missing cases. Missing cases = (189 - n) for each cost listed. Chi-square test results not provided when expected counts less than 80%. Cramer's V values only provided for significant relationships. ^aPercentages represent those identifying cost as a 'major problem' and 'sometimes a problem'. Associations indicated by Cramer's V: ^blow, ^cmoderate.

RCNP overall, the majority of farmers in ORVs (96%) and by 78% of farmers in DVs ($\chi^2 = 11.712$, $V = 0.292$, $p < 0.0001$). Rhinoceros, deer and boar are the most commonly named animals responsible for crop damage surrounding RCNP (Figure 5.4); however, notably elephants cause substantial damages in DVs.

Figure 5.4: Wild animals responsible for crop damage, RCNP (Q#14)



On average, two species of wildlife are named as responsible for crop damage by farmers in RCNP. As indicated by the logistic regression results, DV residents suffered significantly less from crop damage than ORV residents (Table 5.6). The odds of respondents from ORVs reporting high wildlife damage to crops compared to DVs are 33.3 when all other factors are equal. No other demographic variables contributed to the variation in this cost.

Livestock Depredation

Because livestock losses can have a greater financial impact on residents than crop loss, these two impacts from wildlife were examined separately. Three-quarters (75%) of

Table 5.6: Results of logistic regression between demographic variables and number of species damaging crops, RCNP (Q#1, 2, 3, 5, 14, 30)

Socio-economic variables	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>Odds Ratio*</i>
Village Category (DVs)	-3.69	0.67	30.47	0.000	0.03
Gender (Women)	-0.40	0.58	0.49	0.486	0.67
Origin (Migrant)	-0.15	0.51	0.09	0.769	0.86
Wealth	0.67	0.57	1.39	0.239	1.95
Education	0.79	0.59	1.83	0.176	2.21
Age	0.95	0.58	2.68	0.101	2.59
Occupation 1 (Domestic or Agriculture)	0.45	0.97	0.22	0.641	1.57
Occupation 2 (Tourism)	-0.89	0.91	0.95	0.329	0.41
Caste 1 (Low)	-0.38	0.78	0.24	0.624	0.68
Caste 2 (Mid)	0.89	0.54	2.75	0.097	2.44
Nagelkerke R Square	0.59				
N	189				
Missing cases	0				

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 83.1%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

respondents in RCNP raise livestock. Differences between the number of people raising livestock in ORVs (92%) and DVs (53%) are significant ($\chi^2 = 34.84$, $V = 0.442$, $p < 0.0001$). Buffalo, goat, and chicken are the most common animals kept. Almost half of the people raising livestock experience predation on their animals by wildlife (45%, no significant difference between villages, $\chi^2 = 0.48$, $p < 0.49$). Tiger, leopard, mongoose and jackal are the animals most commonly named as responsible for killing livestock (Figure 5.5).

The average number of wildlife species named as responsible for killing livestock in RCNP is 0.5. Logistic regression analysis revealed no significant relationship between village category and livestock loss (Table 5.7). Men were 2.4 times more likely to report high livestock depredation costs than women. People under the age of 45 are 7.8 times

more likely to indicate higher livestock depredation costs than people over 45, when all other factors are equal.

Figure 5.5: Wild animals responsible for livestock depredation, RCNP (Q#23)

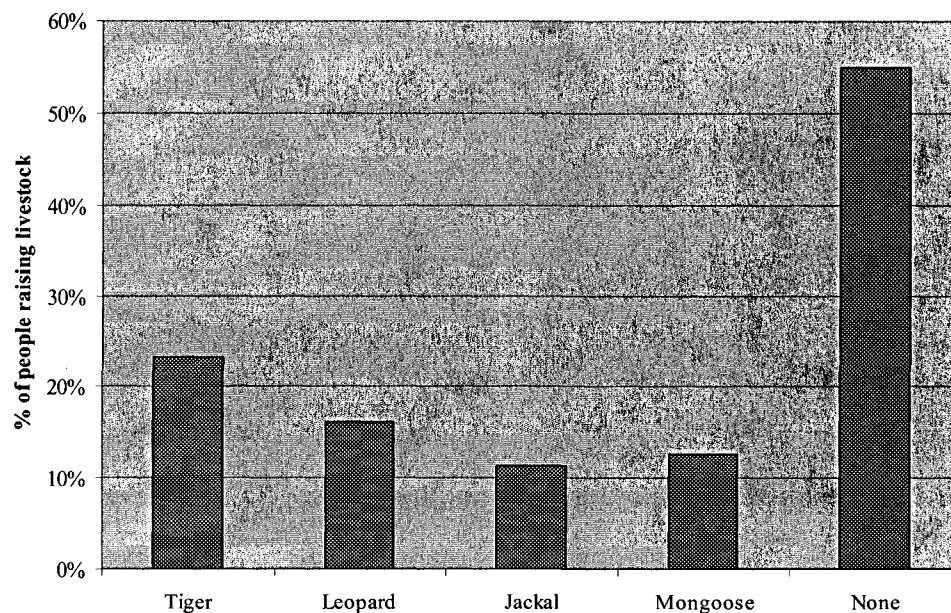


Table 5.7: Results of logistic regression between demographic variables and number of species preying on livestock, RCNP (Q#1, 2, 3, 5, 23, 30)

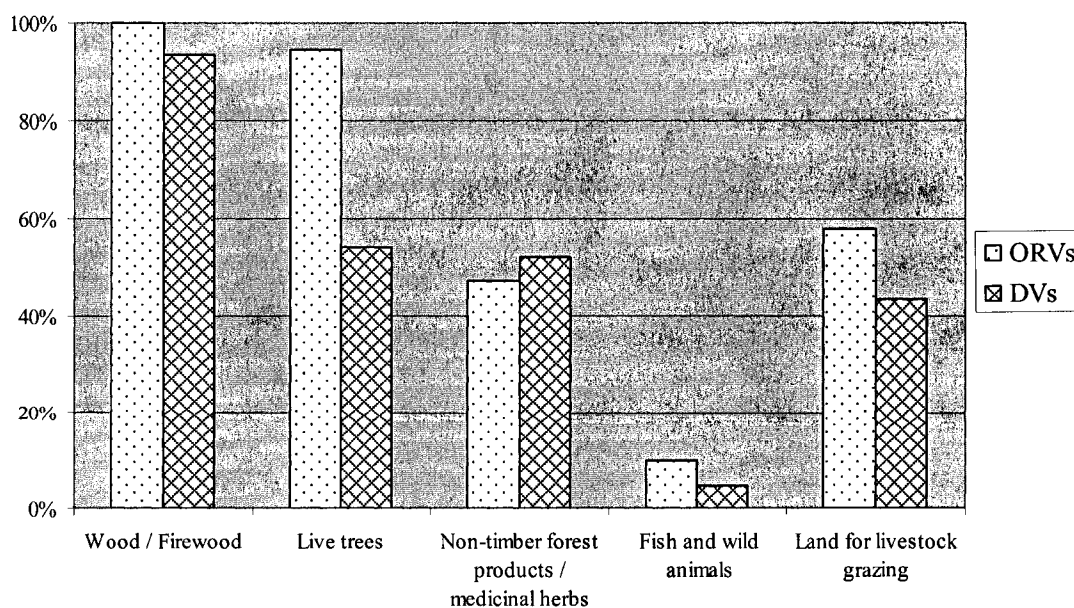
Socio-economic variables	B	SE	Wald	p	Odds Ratio*
Village Category (DVs)	-0.38	0.45	0.72	0.397	0.69
Gender (Women)	-0.90	0.41	4.92	0.026	0.41
Origin (Migrant)	-0.53	0.39	1.83	0.176	0.59
Wealth	-0.95	0.62	2.35	0.125	0.39
Education	-0.58	0.40	2.14	0.144	0.56
Age	-1.15	0.46	6.23	0.013	0.32
Occupation 1 (Domestic or Agriculture)	0.54	0.68	0.64	0.422	1.72
Occupation 2 (Tourism)	-1.13	0.81	1.95	0.163	0.32
Caste 1 (Low)	-1.12	0.62	3.30	0.069	0.33
Caste 2 (Mid)	-0.71	0.42	2.87	0.090	0.49
Nagelkerke R Square	0.22				
N	189				
Missing cases	0				

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 68.8%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

Resource Dependency

Given the impact park policies and regulations have on restricting access to resources, resource dependency was chosen as a measure against which to compare benefit distribution. Respondents were asked to indicate the type and frequency of resource use from within the park. The collection of resources from within the park is conducted by 84% of respondents. Respondents were then asked to indicate if they would like to have increased access to resources, and if yes, what resources and how much they required. Two-thirds of respondents (64%) indicated they would like to have increased access to resources. A large portion of respondents indicated they occasionally collect wood from the park (78%); 98% would like to collect more wood (Figure 5.6). Additional resources people desire include live trees (79%), land for livestock grazing (53%), and non-timber forest products / medicinal herbs (49%). Increased access to resources is needed mainly for supplies of firewood and construction material, and land for livestock grazing.

Figure 5.6: *Desire for increased access to resources, RCNP (Q#56)*



Resource dependency was a scale constructed from these two questions measuring resource use and need, and was intended to reflect the degree of resource dependency. The composite variable ranges from zero to 10, with 10 indicating the highest level of resource dependency. The overall mean for resource dependency in RCNP was 3.2. In a logistic regression analysis, village, age and caste were found to have significant effects on an individual's level of resource dependency (Table 5.8). ORV respondents were 3.2 times more likely to report a high dependency on resources, when all other variables are equal. A younger person (under 45) is 4.3 times more likely to have high resource dependency than an older person. Respondents from the middle castes are 2.7 times more likely to be highly dependent on resources than low and high castes.

Table 5.8: Results of logistic regression between demographic variables and dependency on natural resources, RCNP (Q#1, 2, 3, 5, 30, 54, 56)

Socio-economic variables	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>Odds Ratio*</i>
Village Category (DVs)	-1.16	0.46	6.32	0.012	0.31
Gender (Women)	-0.15	0.39	0.15	0.699	0.86
Origin (Migrant)	-0.27	0.37	0.54	0.461	0.76
Wealth	-0.49	0.49	1.00	0.318	0.61
Education	-0.18	0.39	0.21	0.644	0.84
Age	-1.48	0.44	11.11	0.001	0.23
Occupation 1 (Domestic or Agriculture)	-0.57	0.72	0.64	0.424	0.56
Occupation 2 (Tourism)	-0.75	0.75	1.00	0.318	0.47
Caste 1 (Low)	0.04	0.57	0.01	0.946	1.04
Caste 2 (Mid)	0.99	0.40	6.22	0.013	2.70
Nagelkerke R Square	0.25				
N	188				
Missing cases	1				

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 67.6%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

5.2.3 Distribution of Benefits by Costs

According to the underlying theory behind IBPs, benefits should be directed to those who experience the greatest consequences as a result of park policies and regulations. In order to determine the adequacy of benefit distribution in RCNP, measures of an individual's degree of conflict with the park were compared with their perception of receiving benefits from the park. The relationship between perceived level of benefit and each cost (as measured using number of wildlife species responsible for crop loss and livestock depredation, and resource dependency) was investigated using bivariate simple logistic regression. The only relationship was a negative relationship between crop loss and benefit receipt (Table 5.9). For each one point decrease on the ten-point crop loss scale there is 1.6 odds the respondent will perceive high levels of benefit. By controlling for village in a hierarchical logistic regression equation, the negative relationship between crop loss and benefit receipt disappeared, highlighting the differences in benefit distribution between ORVs and DVs. Resource dependency and livestock loss were insignificant predictors of benefits (Table 5.9).

5.2.4 Discussion

Residents surrounding RCNP recognize personal benefits from the national park, yet the major challenge for IBPs is duplicating programs throughout an entire area affected by conservation (Metcalf 1994). The results clearly indicate substantial differences between ORVs and DVs in terms of perceptions of benefit receipt, identification, and overall distribution. The level of benefits received by households depends only on village category, indicating equal distribution within villages across other demographic variables. However, an examination of the distribution of benefits in relation to

conservation costs incurred by local residents reveals residents experiencing the greatest costs are not directly targeted by IBPs, and residents who suffer the most from crop damage by wildlife (residents in ORVs) actually benefit the least.

Table 5.9: Results of hierarchical logistic regression between costs and perception of benefit receipt, RCNP (Q#14, 23, 54, 56)

Blocks	B	SE	Wald	p	Odds Ratio*	Nagelkerke R Square
<u>Block One</u>						
Crop Loss	-0.46	0.13	13.49	0.000	0.63	0.106
<u>Block Two</u>						
Crop Loss	-0.03	0.16	0.05	0.830	0.97	
Village Category (DVs)	1.98	0.43	21.15	1.000	0.00	0.262
<u>Block Three</u>						
Crop Loss	-0.04	0.16	0.05	0.826	0.97	
Village Category (DVs)	2.31	0.47	24.06	0.000	10.06	
Livestock Loss	0.13	0.23	0.32	0.573	1.14	
Resource Dependency	0.16	0.08	3.69	0.055	1.17	0.289
N	180					
Missing cases	9					

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 72.6%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

The differences between benefits and costs in ORVs and DVs can be explained by differences in livelihood activities between communities (see Appendix 4.20). In ORVs the primary livelihood activity is subsistence-based agriculture, requiring the direct use of subsistence resources to meet livelihood needs. The livelihood activities of residents in DVs have largely been converted to tourism, increasing economic returns and eliminating the need for subsistence resource use. While agriculture and subsistence livelihoods require natural resource inputs, tourism depends on the importation of secondary market goods to fulfill tourist demands for food, water, and souvenirs and it provides the cash

flow necessary for purchasing market goods to fulfill livelihood needs of households involved in tourism (Walpole and Goodwin 2000). The substitution of tourism as a livelihood strategy has also been shown to lead to an abandonment of extractive activities due to limited time available to collect resources (Stem et al. 2003).

Benefit receipt, as measured by a relative scale, indicates DVs perceive more household benefits from conservation and development than ORVs. This result confirms findings in other studies of regional inequities in the receipt of protected area benefits (Walpole and Goodwin 2000; Sekhar 2003). No other demographic variables were related to perceptions of benefit receipt, indicating that, within villages, benefits are equal and not differentiated based on gender, age, occupation, wealth, education, or caste. These results contradict common findings regarding benefit distribution in protected areas in developing countries. In most cases, benefits are not equally distributed throughout a community, with women or the poor among the disadvantaged (Wells and Brandon 1993; Goodwin and Roe 2001).

Tourism is widely criticized as an IBP for its limited ability to provide benefits on a regional level to all areas impacted by protected area policies (Barrett and Arcese 1995). The economic benefits received through direct employment or participation in tourism are higher in DVs. RCNP provides employment opportunities in tourism to approximately 1% of the population surrounding the park (Bookbinder et al. 1998). Such benefits accrue more towards the individual and could explain why overall household benefits are higher in DVs. While direct employment in tourism is limited to residents of DVs, tourism benefits have been extended indirectly to other areas. In an effort to provide benefits to those not involved in tourism, yet suffering hardships as a result of the

park, RCNP instituted a bylaw in 1996 requiring that 50% of revenues from tourist entry fees be distributed to buffer zone committees for use in community development projects. With approximately one-third of respondents identifying indirect benefits from tourism, local residents, especially in ORVs, have recognized this sharing of tourism revenues. The indirect tourism benefits more common in ORVs manifest themselves in communal development projects, which provide incrementally less benefit per household. In some cases, such social development projects provide no meaningful contribution to local livelihoods. For example, in national parks in Zimbabwe and Uganda, revenue was invested in the construction of school facilities; however, residents suffering most from crop and livestock losses to wildlife could not afford to have their children in school, instead of protecting crops and livestock from predation (McIvor 1997; Archabald and Naughton-Treves 2001). Communal social development benefits may not be meaningful to residents facing livelihood implications as a result of the park, and may explain why social development benefits were not recognized in ORVs. As a respondent's overall level of benefit increases with level of participation in tourism, the benefit from direct employment exceeded the benefits from no direct participation, despite DNPWC's efforts to address disparities by disbursing entry fee revenues to all villagers. These results indicate inequities in benefit distribution remain for those not able to participate directly in tourism.

The wider applicability of these results across all ORVs in the buffer zone needs to be considered cautiously, as the ORVs included in this research also benefited from small-scale tourism revenues earned in buffer zone community forests (Baghmara and Kumrose) from elephant rides, canoe trips, guided walks, and visitors to *machans* (watch

towers). Although benefits received by individual households from these tourist activities would constitute indirect tourism benefits, tourism revenues, in addition to those received from park entry fees, are not typical of other community forests in the buffer zone. In villages with buffer zone community forests offering no tourist attractions, the indirect benefits recognized from tourism are expected to be lower than in ORVs included in this study.

Whether immigrants attracted to the economic opportunities from tourism, urban or international travel agencies, or suppliers of secondary market goods, outsiders are unintended beneficiaries of protected area tourism (Ross and Wall 1999; Sekhar 2003). While this research does not involve examining the loss of local benefits to the entire realm of outsiders, no difference was found in benefit receipt perceptions between immigrants and native residents. A study by Bookbinder et al. (1999) in RCNP found 72% of hotel employees and 74% of nature guides originated from the local area; however, 61% of hotel ownership was non-local. Although some employment opportunities are available to local residents, with outside ownership and more than half of the bookings for hotels in the Chitwan area made in advance in Kathmandu, the local area loses substantial tourism revenues (Bookbinder et al. 1998). Residents recognize this receipt of revenue by outsiders, as illustrated by this comment from a respondent:

Many people in Sauraha and other neighboring villages took hotel management and cooking training, but only a few were lucky with jobs. As the majority of the hotels in Chitwan are owned and operated by outsiders, they prefer their own people for jobs. They try not to hire local people.

To further exacerbate the limited revenue contributed to the local economy from tourism, the market is deflated through competitive pricing and budget travelers, resulting from an unregulated industry in RCNP (Bookbinder et al. 1998). Revenue leakage is a common

problem of tourism to developing countries (Barrett and Arcese 1995; Honey 1999; Walpole and Goodwin 2000; Goodwin and Roe 2001; Loon and Polakow 2001).

While social development benefits provide the primary method to extend conservation benefits on a regional basis, and are the fundamental approach behind revenues distributed throughout the buffer zone, few respondents recognize such benefits to their household resulting from the park. Social development is more frequently indicated as a benefit received by the community as a whole rather than by individual households; therefore, supporting the explanation for differences in household level of benefits from DVs given the prevalence of social development projects in ORVs. These findings coincide with past research on social development benefits from conservation (McIvor 1997; Archabald and Naughton-Treves 2001). Although social developments provide the primary means used to reach ORV residents not receiving direct economic benefits from conservation, surprisingly, DVs report receiving social development benefits more frequently than ORVs. Sanitation was the main social benefit reported by all villages. Because of the garbage generated by tourists, village sanitation may be more of an issue, and programs designed to minimize waste may be more obvious in DVs. A former chair for a VDC in the study area said: “One good thing the buffer zone has done is keeping the neighborhood clean, but the cleaning campaign is more effective in and around tourist areas only.”

The representation of benefits from social development could be deflated due to the exclusion of activities of outside development agencies such as KMTNC and WWF-Nepal. Such organizations focus development activities in the buffer zone, and respondents may not consider these activities as benefits from the park if they are aware

of the distinction between these organizations and the park management. On the other hand, respondents' accounts of social development benefits from the park may include projects not initiated by the DNPWC. Because the park works in partnership with these organizations, projects initiated by outside agencies are encompassed in the overall management philosophy and approach of incentive-based conservation in RCNP.

Resource collection constitutes a significant daily activity of residents surrounding RCNP (Matthews et al. 2000; Stræde and Helles 2000; Nagendra et al. 2005). The availability of resources for use is considered a benefit from the park and is the most frequent benefit mentioned by residents in ORVs. Every year the park is opened for a period of three days to allow for the extraction of grass by buffer zone residents to fulfill personal needs (Stræde and Helles 2000). In Royal Bardia National Park, grass cutting over a period of ten days was insufficient to fulfill the needs of indigenous Tharu (Brown 1997). Thatched roof construction on Tharu houses requires 250 bundles of grass every two to three years, yet typical extraction rates are only five bundles per day. Based on these estimates, under the current three-day per year grass cutting program in RCNP, residents would require sixteen years to collect enough grass for a traditional Tharu thatched roof. Yet, despite inadequate resource provisions within the park boundaries, respondents still recognize household and community benefits from resources; therefore, indicating the use of resources from the park during the permitted grass cutting period is supplemented by illegal extraction from the park throughout the year, and from resources in buffer zone forests.

Buffer zone community forest committee representatives suggest these forests provide for the majority of local needs and have reduced the pressure placed on park

resources; however, discussions with local residents and community informants reveal park resources are being extracted due to fees levied for resources and the strong guard presence in buffer zone community forests. Illegal extraction is confirmed by observations and reports in the field:

Now, villagers bring all kinds of things from the park, as the park has not been able to stop them. The community forest has provided us with limited amount of forest resources, which is why many people are not happy with the park staffs. Instead of paying the community forests, people in this village prefer to go to the park across the river to collect khar [grass] and firewood for free.

During the field research, the research team witnessed villagers poaching park resources on numerous occasions. On one occasion, more than 200 women were seen crossing the Rapti River for daily resource collection from the park. Some literature suggests the protection afforded to community forests has come at the expense of the national park as a result of perceptions of personal ownership over community forests, with a tragedy of commons scenario occurring in the national park (Ostrom 1990; Nagendra 2002). However, discussions with villagers suggest illegal extraction in the national park and protection of community forests in the buffer zone are associated more with levels of enforcement. In large protected areas, the absence of efficient enforcement mechanisms has also been argued to result in a tragedy-of-the-commons scenario (Ostrom 1990; Van Schaik and Rijksen 2002).

Conservation benefits were mentioned by less than one-fifth of respondents. Since such benefits are not typically associated with rural residents in developing countries (Muller-Böker and Kollmair 2000; Balmford and Whitten 2003), these modest findings indicate an interesting trend in RCNP. Local residents' recognition of intrinsic benefits from conservation could provide an indication of the success of educational efforts on the

part of DNPWC and partner organizations. The value placed on wild animals by respondents also suggests the presence of tourism affects local perceptions of wildlife. Exposure to tourists has been found to foster an appreciation for intrinsic conservation values (Stem et al. 2003). However, some wildlife conservation value may also be explained by religion (Heinen and Shrestha 2006). Hinduism is the primary religion practiced in the terai region of Nepal. In Hinduism, the god, Ganesh, takes the form of an elephant. During the field research a wild bull elephant crossed the park boundaries and spent time around the villages in the study area. The elephant posed a threat to human safety, damaging homes, entering hotel grounds, and stampeding people, so villagers prayed to Ganesh for the elephant to return to the park.

Mitigation benefits were mentioned by only a few respondents. Despite the significant livelihood impacts of wildlife on crops and livestock, actions on the part of the park management to mitigate damage to livelihoods are not recognized by the local people. In fact, little is done on the part of the DNPWC to mitigate conflicts between wildlife and people. Farmers must carry out personal mitigation measures by constructing *machans* or watchtowers where they protect crops in season overnight by scaring wildlife from fields. The park does provide a compensation scheme to cover a portion of losses caused by wildlife, but the claim process is complicated and time consuming, requiring livelihood chores to be abandoned to complete and submit a claim. The amount received is often insufficient to cover the loss, and, as a result, few villagers claim losses from wildlife. Crop loss has been increasing in frequency, which can be attributed to ineffective grassland management within the park, increased quantity and quality of habitat outside the park (from regeneration of and protection afforded to

community forests), and successful wildlife conservation efforts (Dinerstein et al. 1999; MFSC 2000; McLean and Stræde 2003; Heinen and Shrestha 2006). Villagers also commented on how management practices have led to an increased occurrence of crop damage in the buffer zone, as illustrated by this comment from a farmer in an ORV:

Long ago when habitat management was done with controlled fire and seasonal cutting of grass, park animals used to get lots of soft grass. Now as those practices are not carried out, wild animals come to the villages looking for soft grass.

Some residents suggest erecting fences to surround the park and community forests to restrict wildlife movement; however, erecting fencing structures to prohibit access of large animals, such as elephants, is expensive, and often ineffective (O'Connell-Rodwell et al. 2000), and only 11% of the buffer zone population consider fences to be effective in preventing wildlife damage (MFSC 2000). Mitigation measures were one of the most frequently identified community needs indicated by respondents (Appendix 5.1). Given the widespread conflict with wildlife, improvements to mitigation measures surrounding RCNP are necessary and would offer significant contributions to improving local attitudes toward wildlife. A representative from a community-based support group for residents facing threats from wildlife expressed the need for wildlife mitigation measures:

If we had the money and the mandate, we would have already started the first phase of our short-term preventive measures such as digging trenches, building fences and watch towers...things that prevent wild animals from entering the farms. These short-terms measures would automatically contribute to long term goals. We have lived in these villages with all kinds of wild animals for decades, so we know how to deal with them. We know when and why wild animals enter the village, which corridors they use for their trips, and how to ward them off. All we need is financial and logistic help from the park authority, and we will be able to mitigate the problem by 70%. Honestly, you [currently] have to literally trap, kill and eat them to get rid of them. This is a good way of compensating your loss. I know some people are doing it already.

In regions where conflicts between humans and wildlife are a common occurrence, resulting in substantial losses to rural residents surrounding protected areas, IBPs must encompass efforts to minimize conflict through mitigation measures and compensate residents for losses (O'Connell-Rodwell et al. 2000). Mitigation not only includes control and compensation for wildlife costs, but also includes sharing the benefits derived from the protection of natural processes. Such benefits have been found to be instrumental in fostering local support for community based conservation projects in India (Poffenberger 1994), yet results indicate the recognition of these benefits from conservation in RCNP is not occurring.

Participation is not recognized as a benefit from the park. Under the traditional exclusionary park approach, active participation was not a consideration in the initial institutional design (Gbadegesin and Ayileka 2000; Kapoor 2001; Brown 2002). Participation in RCNP does not constitute active involvement or empowerment in park resource management or decision making, and is limited to the consultation role provided for buffer zone management and, therefore, provides few benefits. Some respondents do value the benefits provided by participation in community committees, such as provision for loans, and also recognize benefits from increased awareness of conservation issues provided by the park.

The costs borne by local residents as a result of conservation have been widely documented in the literature (Norton-Griffiths and Southey 1995; Shyamsundar and Kramer 1996; Balmford and Whitten 2003). The most significant costs borne by residents surrounding RCNP are damage caused by wildlife, threats to human safety, and restrictions on access to resources. Damage caused by wildlife is a problem faced in

varying degrees by most villages surrounding protected areas (Kenny 1997; Mishra 1997; Sekhar 1998; Ikeda 2004). The large animals protected in RCNP, such as rhinoceros, elephant, and tiger have substantial implications for the livelihoods of surrounding villagers. Residents do not go out at night for fear of threats to personal safety. According to conversations with villagers, such fear actually encourages conversion to alternative fuel sources, to limit the need to enter the forest to collect resources. An increased trend towards stall feeding livestock can also be partially attributed to apprehension in entering the forest on a daily basis with livestock (Matthews et al. 2000). Due to a higher number of people growing crops and involved in subsistence agriculture, ORVs suffer most from crop loss and restrictions on access to resources. Livestock losses are highest among men and younger respondents. Younger respondents and members from the middle caste group are also more dependent on resource extraction. For IBPs to compensate for losses and act as incentives, benefits need to accrue to those suffering the most consequences as a result of conservation (Metcalf 1994).

The results suggest the benefits from RCNP are not distributed to account for losses resulting from protected wildlife or restrictions on access to resources. In fact, those suffering most from crop loss benefit least. One resident summarized the problem with distribution of tourism benefits:

I tell you that the people who are most affected by the park benefit least, because they are poor farmers who lose crops to wild animals every year but get nothing from tourism in their village. On the other hand, outsiders reap all the benefits from tourism, but are not affected by wild animals, because they don't grow crops or vegetables. Similarly, outsiders take most of the tourism jobs that otherwise would go to local residents.

Different levels of benefit receipt between villages account for this discrepancy between crop loss and benefits and support the wide criticisms of IBPs in the literature in terms of

the unfair distribution of benefits across large regional districts (Barrett and Arcese 1995; Bookbinder et al. 1998; Brandon 1998b). In contrast to DVs, ORVs experience the most costs associated with conservation, yet receive the least benefit from conservation.

Within villages benefit distribution is equal, but not fair, as benefits are not preferentially targeted towards individuals experiencing the most costs.

Benefits under IBPs in RCNP are recognized by local residents. The only demographic variable proven to be significant in determining level of benefits recognized is a respondent's village category. People in ORVs receive fewer benefit overall than residents of DVs. A respondent's level of participation in tourism also leads to inequities in benefit receipt, with those directly employed in tourism receiving the most benefit. Despite the discrepancy in benefit distribution between villages and between levels of involvement in tourism, it is important to note that RCNP appears to be making progress in distributing benefits to ORVs, given the number of respondents recognizing indirect benefits from tourism. Regional inequities also account for the inability of IBPs to benefit those most affected by protected wildlife. The main flaw in IBPs in RCNP is a limited ability to replicate benefits throughout the buffer zone, providing similar levels of benefit to ORVs as received by DVs.

5.3 Annapurna Conservation Area

5.3.1 Benefit Identification and Distribution by Demographic Characteristics

Respondents in ACA were asked the same questions as respondents in RCNP to determine if local residents recognize benefits from the conservation area. Among the answers given to the open-ended question "Do you see a need for the conservation area to exist", 46% of respondents suggest ACA benefits local people (Table 5.10). To

Table 5.10: Reasons given in support of ACA's existence^a (Q#32)

Because of...	Total	Villages		χ^2	df	p	Cramer's V
		Destination	Off-Route				
Our benefit	45.7%	44.7%	47.1%	0.033	1	0.865	-
Plants	41.0	34.0	49.4	3.970	1	0.046	0.156 ^b
Wildlife	25.5	22.3	29.4	0.884	1	0.347	-
Our future	16.5	11.7	22.4	3.135	1	0.077	-
Protect natural processes	14.9	15.5	14.1	0.004	1	0.948	-
Protect resources for use	10.6	7.8	14.1	1.364	1	0.243	-
Other developments for us	8.0	9.7	5.9	0.481	1	0.488	-
Tourism	2.7	3.9	1.2	0.480	1	0.488	-
Other revenue	2.1	1.9	2.4	-	-	-	-
Scenery	1.6	1.9	1.2	-	-	-	-
No reason given	32.4	32.0	32.9	0.000	1	1.000	-
Total respondents	188	103	85				

^aBased on answers provided to open-ended question "Do you see a need for the park to exist". Answers categorized and coded to allow for quantitative analysis. Percentage based on total number of respondents including those who gave no response. Percentages do not equal 100% because people were allowed to provide more than one response. Chi-square test results not provided when more than 20% of cells have expected cell frequencies less than 5. Cramer's V values only provided for significant relationships. Associations indicated by Cramer's V: ^blow.

determine exactly what initiatives local residents recognize as benefits, additional open-ended questions asked respondents to list types of benefits from the conservation area to themselves and their community. Benefits identified include economic opportunities, social development programs, provision of resources for extraction, intrinsic values for resource protection, livelihood protection through mitigation, and perks from participation in conservation and development (Table 5.11).

Economic Benefits

The development of transportation networks through road building is the most common economic benefit mentioned. Household economic benefits from the

conservation area are recognized by 18% of respondents in ACA, while 44% indicate economic benefits are received by their community (Table 5.11). No significant differences exist between village category (DVs or ORVs) and the identification of economic benefits.

Table 5.11: Benefits identified by respondents for household and community, ACA (Q#64, 67)

(2, 103, 85)

Benefits	Total	Villages		χ^2	df	p	Cramer's V
		Destination	Off-Route				
<u>Total Household Benefits</u>							
Economic	17.6%	18.4%	16.5%	0.026	1	0.871	-
Social Development	40.4	43.7	36.5	0.730	1	0.393	-
Extraction	54.3	53.4	55.3	0.013	1	0.910	-
Conservation	16.0	15.5	16.5	0.000	1	1.000	-
Mitigation	1.6	1.0	2.4	-	-	-	-
Participation	9.0	3.9	15.3	6.050	1	0.014	0.198 ^a
<u>Total Community Benefits</u>							
Economic	43.6	40.8	47.1	0.514	1	0.474	-
Social Development	69.7	69.9	69.4	0.000	1	1.000	-
Extraction	58.0	52.4	64.7	2.400	1	0.121	-
Conservation	35.1	38.8	30.6	1.052	1	0.305	-
Mitigation	5.3	3.9	7.1	-	-	-	-
Participation	6.4	4.9	8.2	0.415	1	0.520	-
N	188	103	85				

Percentage based on total number of respondents including those who gave no response. Percentages do not equal 100% because people allowed to provide more than one response. Chi-square test results not provided when more than 20% of cells have expected cell frequencies less than 5. Cramer's V values only provided for significant relationships. Associations indicated by Cramer's V: ^alow.

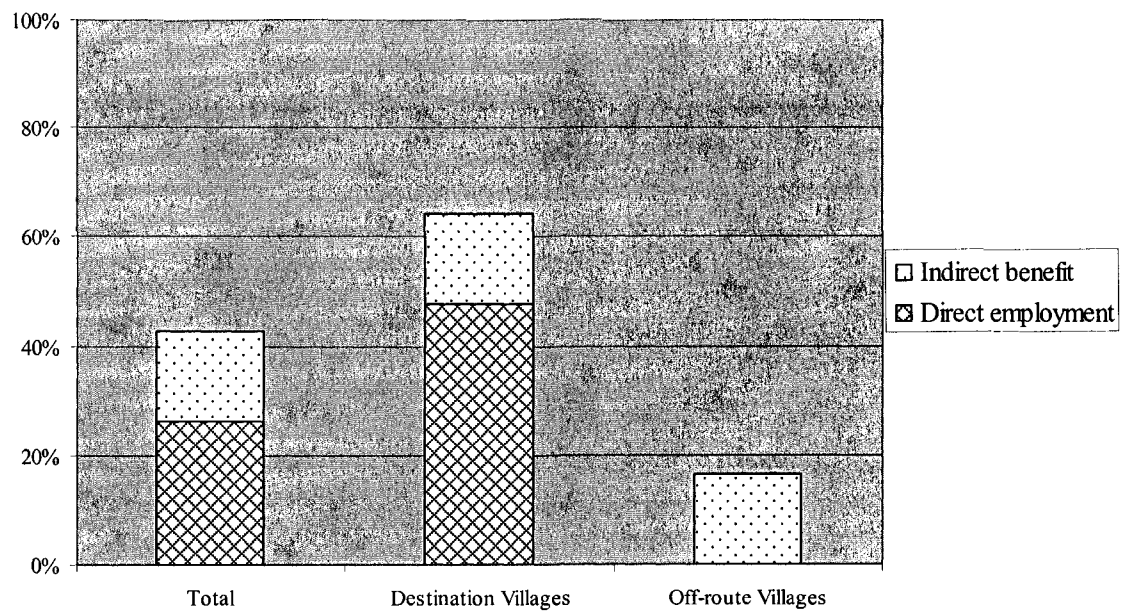
Tourism is the main wage-generating economic activity in ACA. Overall, 44% of respondents recognized benefits from tourism (Table 5.12). Of those perceiving tourism benefits, 61% had a household member directly employed in tourism services (Figure 5.7). Thus, only the remaining 39% recognized indirect benefits from tourism. Significantly more households in DVs perceive benefits from tourism than in ORVs, and have at least one person employed in the tourism industry.

Table 5.12: Respondents perceiving benefits from tourism (direct and indirect), ACA (Q#3, 76G, I)

	Total	Villages		χ^2	df	p	Cramer's V
		Destination	Off-route				
Tourism benefits	44.4%	64.1%	18.2%	35.753	1	0.000	0.457 ^c
Direct employment ^a	61.3	74.2	0.0				
Indirect benefit ^a	38.8	25.8	100.0	23.786	1	0.000	0.579 ^d
N	180	103	77 ^b				

^aExpressed as a percentage of people perceiving benefits from tourism. ^bEight cases missing. Associations indicated by Cramer's V: ^cmoderate, ^dsubstantial.

Figure 5.7: Perceptions of tourism benefit receipt, ACA (Q#3, 76G, I)



Social Development Benefits

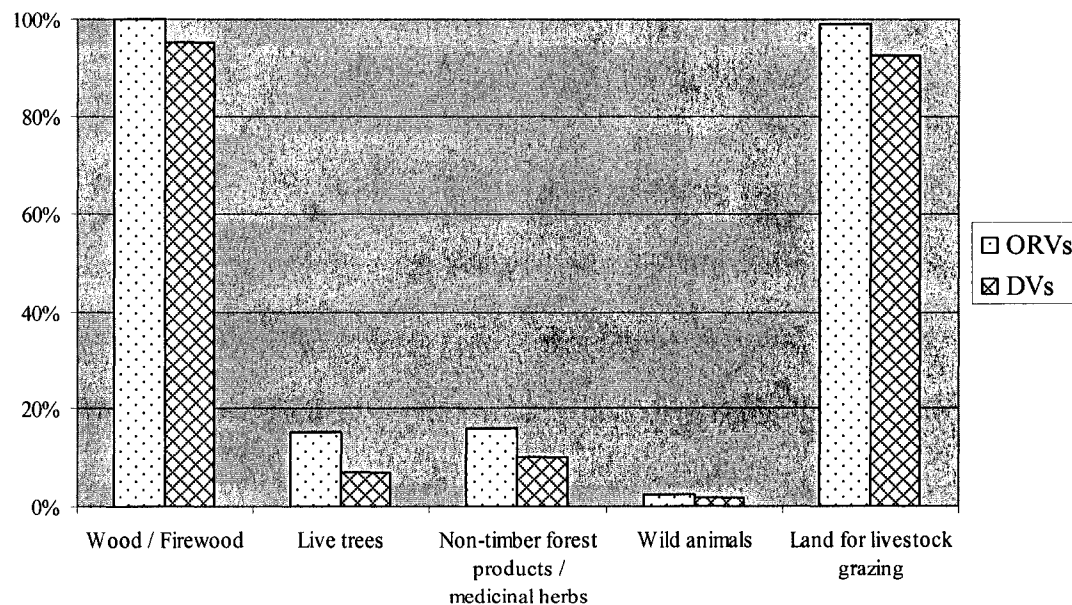
Benefits from social development are the most frequently noted category of benefits in ACA for households and communities (40% and 70% respectively). Similar to RCNP, the main social benefits recognized by ACA respondents include: sanitation management

through organized village cleanup, garbage control and toilet construction, trail and bridge construction and maintenance, and access to drinking water. No significant differences exist between DVs or ORVs.

Extraction Benefits

Wood, firewood, grass and fodder are the most frequent resources listed as benefits from conservation. Figure 5.8 provides a summary of the resources currently used by respondents based on questionnaire responses. The conservation area is used by all respondents for wood collection (100%) and livestock grazing (99%). Second to social development benefits, availability of resources for use is identified as a household benefit by 54% of respondents and as a community benefit by 58%.

Figure 5.8: *Current resource use, ACA (Q#54)*



Conservation Benefits

More than twice as many respondents recognize the receipt of conservation benefits by their community (35%) then by their household (16%). Reforestation and forest conservation in general are the most commonly cited benefit.

Mitigation Benefits

Few respondents in ACA mention household or community benefits from mitigation efforts on the part of conservation area authorities (2% and 5% respectively). Such results indicate respondents perceive little is being done to directly reduce the impact conservation area policies have on local residents.

Participation Benefits

Although 61% of respondents indicate participating in conservation and development committees, only 9% recognize participation as a benefit to their household, and 6% recognize it as a benefit to their community. ORVs do, however, recognize participation benefits for their household significantly more than DVs.

Perceptions of Benefit Receipt

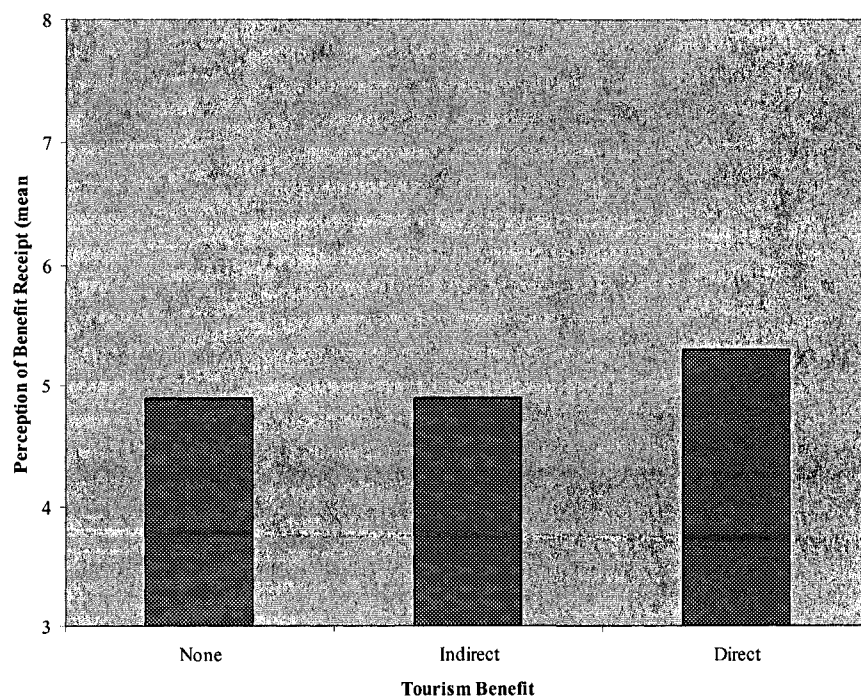
As indicated by the logistic regression results, the odds a wealthy respondent will report high levels of benefit are 2.2 times greater than for poor respondents, all other factors being equal (Table 5.13). No other demographic variables contributed to the variation in perceptions of benefit receipt. An individual's type of benefit from tourism (none, indirect, direct) has no relationship with levels of perceived benefit. Figure 5.9 shows benefit perceptions remain constant regardless of the type of involvement in the tourism industry.

Table 5.13: Results of logistic regression between demographic variables and perception of benefit receipt, ACA (Q#1, 2, 3, 5, 30, 63A, 66A)

Socio-economic variables	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>Odds Ratio*</i>
Village Category (DVs)	-0.02	0.40	0.00	0.960	0.98
Gender (Women)	0.36	0.35	1.07	0.301	1.43
Origin (Migrant)	-0.96	0.53	3.28	0.070	0.38
Wealth	0.80	0.38	4.48	0.034	2.22
Education	0.29	0.39	0.55	0.457	1.33
Age	-0.19	0.37	0.25	0.616	0.83
Occupation 1 (Domestic or Agriculture)	-0.27	0.55	0.25	0.615	0.76
Occupation 2 (Tourism)	-0.31	0.61	0.26	0.608	0.73
Caste 1 (Low)	-0.38	0.46	0.67	0.413	0.68
Caste 2 (High)	0.25	0.64	0.15	0.699	1.28
Nagelkerke R Square 0.10					
N 171					
Missing cases 17					

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance.
Overall fit of predicted to observed results = 62.6%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

Figure 5.9: Perception of benefit receipt by tourism benefit, ACA (Q#3, 63A, 66A, 76G, I)



Results of Kruskal-Wallis show differences are non-significant ($\chi^2 = 1.513$, $df = 2$, $p = 0.5$).

5.3.2 Costs

Overall, a third of respondents in ACA (34%) indicate experiencing problems as a result of the conservation area. Significant differences exist when responses are compared between village categories (Table 5.14). Conservation costs are reported by half of ORVs (49%), and less than a quarter of DVs (22%). Damage caused by wild animals is the main problem experienced by both categories of villages; however, a significantly larger portion of respondents from ORVs (93%; DVs 65%) identified this issue. Threats to human safety were also a concern more common in ORVs (55%, DVs 10%). Other problems experienced by ORVs include increased cost of living (38%), confrontations with conservation authorities (25%), and restrictions on access to resources (23%). In addition to damages caused by wildlife, DVs experience problems meeting subsistence needs (28%), an increased cost of living (28%), and restrictions on access to resources (24%). Later in this chapter, threats to crops and livestock from wildlife and restrictions on access to resources will be further examined to provide an indication of who experiences the most consequences from the conservation area to evaluate benefit distribution.

Crop Damage

Crops are grown by 90% of respondents and represent the primary livelihood activity throughout ACA, with 95% growing crops in ORVs, and 86% in DVs. Farmers grow an average of 4.6 crop varieties, of which buckwheat, potato, maize, barley, and apple are the most common. Overall, 65% of crop growers suffer damages caused by wildlife, but ORVs suffer the most loss with 75% of farmers experiencing a loss of crops to wildlife

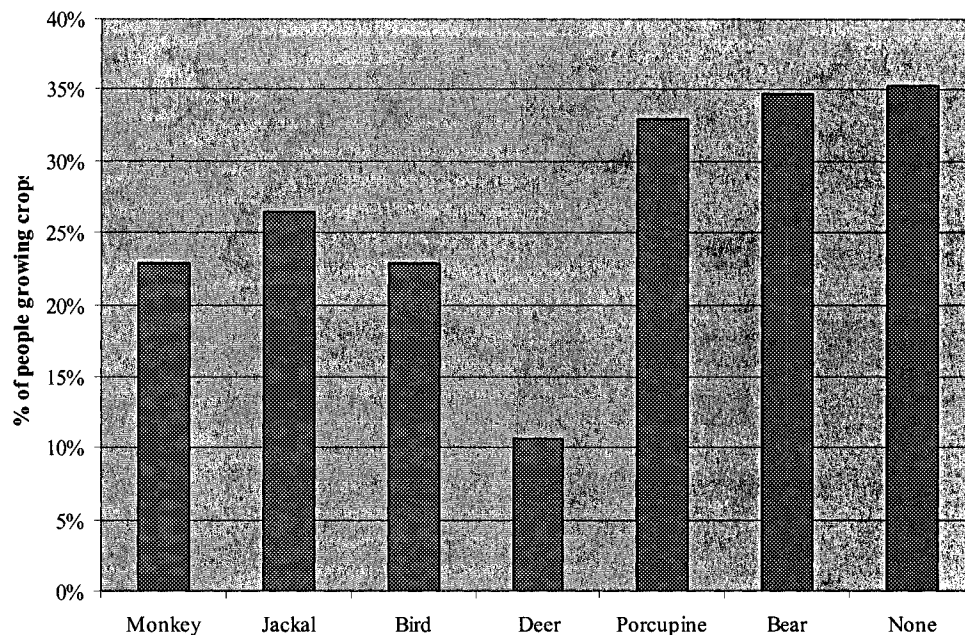
Table 5.14: Conservation costs, ACA (Q#50, 51)

Problems	Villages			χ^2	df	p	Cramer's V
	Total	Destination	Off-Route				
Experience some costs (n = 184)	34.2%	22.0%	49.4%	14.229	1	0.000	0.290 ^b
Damages caused by wild animals (n = 150) ^a	79.3	65.3	93.3	16.265	1	0.000	0.346 ^c
Confrontations with conservation authorities (n = 146) ^a	19.9	14.9	25.0	1.761	1	0.184	-
Threats to human safety (n = 147) ^a	32.7	9.6	55.4	33.026	1	0.000	0.488 ^c
Restrictions on access to resources (n = 147) ^a	23.8	24.3	23.3	0.000	1	1.000	-
Restrictions on livestock grazing areas (n = 148) ^a	8.8	10.7	6.8	0.281	1	0.596	-
Inability to meet subsistence needs (n = 144) ^a	23.6	28.8	18.3	1.641	1	0.200	-
Decline in cultural values (n = 134) ^a	3.7	2.7	5.0	-	-	-	-
Loss of economic opportunities from the sale of natural resources (n = 137) ^a	16.8	16.9	16.7	0.000	1	1.000	-
Increased costs of living (n = 137) ^a	32.8	28.2	37.9	1.055	1	0.304	-
N	188	85	103				

Percentages based on total number of respondents excluding missing cases. Missing cases = (188 - n) for each cost listed. Chi-square test results not provided when expected counts less than 80%. Cramer's V values only provided for significant relationships. ^aPercentages represent those identifying cost as a 'major problem' and 'sometimes a problem'. Associations indicated by Cramer's V: ^blow, ^cmoderate.

(DVs 55%, $\chi^2 = 6.755$, $V = 0.212$, $p < 0.009$). Bear, porcupine, jackal, monkey and birds are most often named as responsible (Figure 5.10).

Figure 5.10: Wild animals responsible for crop damage, ACA (Q#14)



On average, 1.5 wildlife species are named responsible for crop damage by farmers in ACA. A logistic regression analysis indicated that ORV residents suffered more from crop loss than DV residents (Table 5.15). The odds of respondents from ORVs reporting high wildlife damage to crops compared to DVs are 3.5, all other factors being equal. Origin, occupation and caste also had significant partial effects, with all other factors being equal and employing a 0.05 criterion of statistical significance. Native residents were 3.6 times more likely to name many wildlife responsible for crop damage than immigrants. Participation in agriculture or domestic chores leads to respondents being 4.8 times more likely to report high crop damage than those involved in other

occupations. The odds of a low caste respondent reporting a high number of species responsible for crop damage are 5 times greater than for respondents from middle or high castes.

Table 5.15: Results of logistic regression between demographic variables and number of species damaging crops, ACA (Q#1, 2, 3, 5, 14, 30)

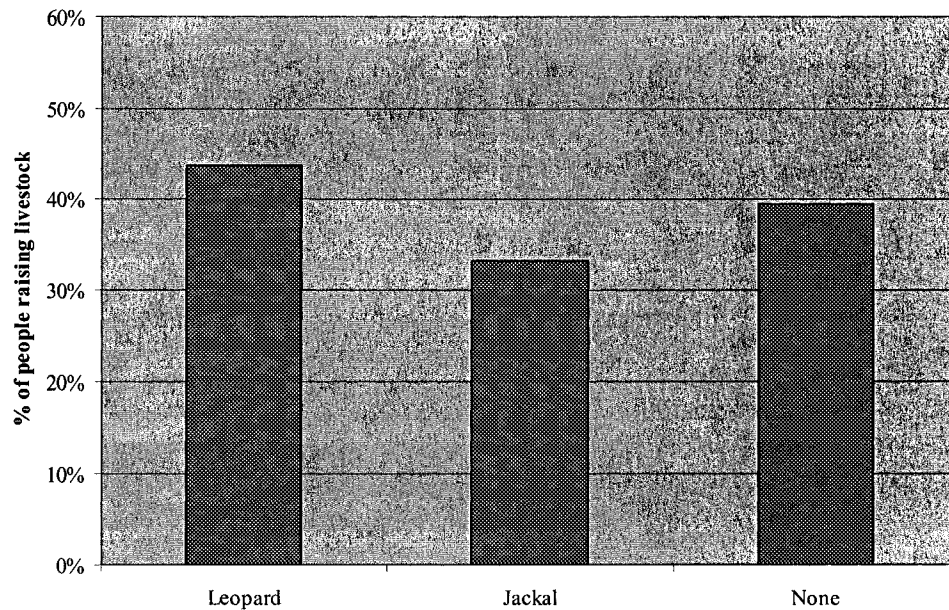
Socio-economic variables	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>Odds Ratio*</i>
Village Category (DVs)	-1.25	0.43	8.68	0.003	0.29
Gender (Women)	-0.24	0.39	0.38	0.536	0.79
Origin (Migrant)	-1.28	0.61	4.43	0.035	0.28
Wealth	0.04	0.42	0.01	0.928	1.04
Education	0.63	0.46	1.85	0.174	1.87
Age	0.42	0.41	1.03	0.311	1.52
Occupation 1 (Domestic or Agriculture)	1.57	0.64	6.07	0.014	4.80
Occupation 2 (Tourism)	0.49	0.80	0.38	0.540	1.63
Caste 1 (Low)	1.61	0.50	10.24	0.001	5.00
Caste 2 (High)	0.38	0.78	0.24	0.628	1.46
Nagelkerke R Square	0.36				
N	188				
Missing cases	0				

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance.
Overall fit of predicted to observed results = 74.5%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

Livestock Depredation

In ACA, 85% of respondents raise livestock, with cow, chicken, horse, and ox the most common animals kept (no significant difference between villages, $\chi^2 = 1.69$, $p < 0.2$). Overall, 61% of the people raising livestock experience predation on their animals by wildlife, but ORVs suffer the most, with 71% of farmers experiencing a loss of livestock (DVs 51%, $\chi^2 = 5.79$, $V = 0.203$, $p < 0.02$). Leopard and jackal are named most frequently as responsible for killing livestock (Figure 5.11).

Figure 5.11: Wild animals responsible for livestock depredation, ACA (Q#23)



The number of wildlife species named as responsible for killing livestock is an average of 0.7. A Mann-Whitney U test indicated respondents from ORVs had a higher number of wildlife species killing their livestock ($M = 0.89$, $Mdn = 1$, $SD = 0.86$) than respondents from DVs ($M = 0.59$, $Mdn = 0$, $SD = 0.82$; $Z = -2.646$, $p < 0.008$). By controlling for demographic variables in a logistic regression equation, the relationship between livestock loss and village category disappeared, with wealth and occupation showing significant partial effects (Table 5.16). The odds of poor respondents reporting high livestock depredation are 3.6 times higher than for the wealthy. The variables created for occupation show odds ratios of 4 for agricultural and domestic workers and 5.3 for respondents employed in tourism, as compared to other occupations when all other variables are equal.

Table 5.16: Results of logistic regression between demographic variables and number of species preying on livestock, ACA (Q#1, 2, 3, 5, 23, 30)

Socio-economic variables	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>Odds Ratio*</i>
Village Category (DVs)	-0.54	0.41	1.78	0.182	0.58
Gender (Women)	-0.22	0.34	0.39	0.533	0.81
Origin (Migrant)	-0.43	0.50	0.75	0.388	0.65
Wealth	-1.29	0.38	11.63	0.001	0.28
Education	0.18	0.39	0.22	0.643	1.20
Age	0.03	0.37	0.01	0.931	1.03
Occupation 1 (Domestic or Agriculture)	1.39	0.57	5.87	0.015	4.00
Occupation 2 (Tourism)	1.66	0.66	6.25	0.012	5.25
Caste 1 (Low)	0.02	0.46	0.00	0.969	1.02
Caste 2 (High)	-0.01	0.67	0.00	0.994	1.00
Nagelkerke R Square	0.22				
N	188				
Missing cases	0				

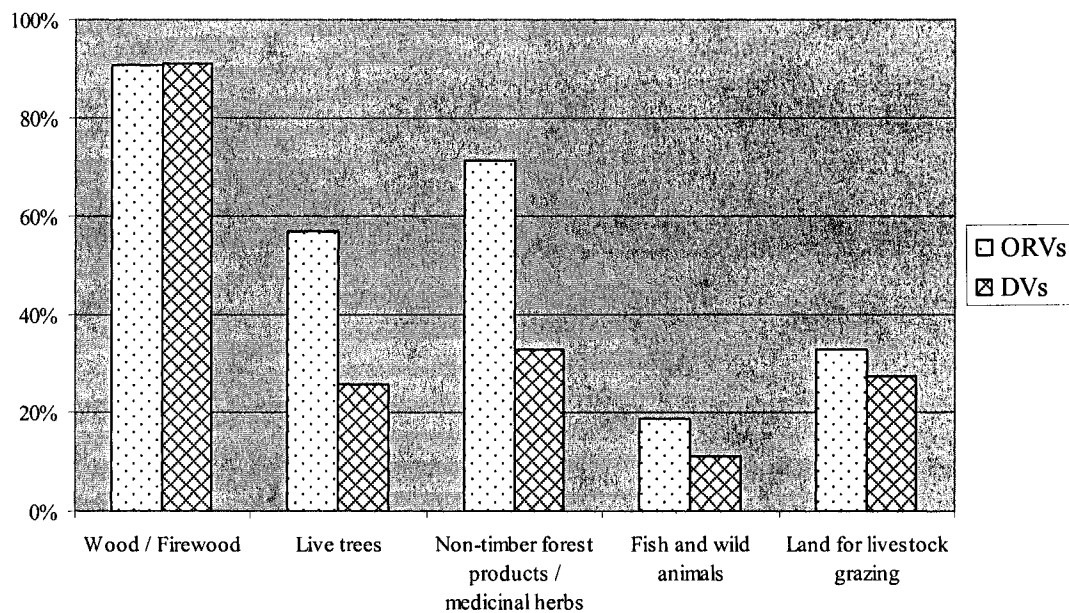
B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance.
Overall fit of predicted to observed results = 67.0%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

Resource Dependency

Respondents were asked to indicate the type and frequency of resources used from within the conservation area. Almost all respondents collect resources from the conservation area (98%), and 53% indicate a desire to have increased opportunity for resource collection. All respondents indicated collecting wood from the conservation area; however 91% would like to collect more. The current land available for livestock grazing appears to be sufficient, with only 33% wanting more access. Most significant is the apparent disconnect between demand and current levels of use of live trees, non-timber forest products / medicinal herbs, and wildlife (Figure 5.12, cf. Figure 5.8). Few respondents admit to collecting these resources from the conservation area, but demand for increased access is notable: residents want access to live trees (57%), non-timber

forest product / medicinal herbs (72%), and wildlife (19%). Increased access to resources is needed mainly for supplies of firewood, construction material, and herbal medicine.

Figure 5.12: *Desire for increased access to resources, ACA (Q#56)*



The overall mean for resource dependency in ACA was 4.4, on a scale from zero to 10. Total dependency on natural resources was significantly higher in ORVs ($Z = -2.102$, $p < 0.04$). A logistic regression analysis was employed to examine this relationship with consideration for other demographic variables (Table 5.17). By controlling for demographic variables in the equation, the relationship between resource dependency and village disappeared, with no other demographic variables contributing to the variation in resource dependency, indicating none of the variables tested are associated with resource dependency.

Table 5.17: Results of logistic regression between demographic variables and dependency on natural resources, ACA (Q#1, 2, 3, 5, 30, 54, 56)

Socio-economic variables	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>Odds Ratio*</i>
Village Category (DVs)	-0.36	0.38	0.91	0.341	0.70
Gender (Women)	-0.29	0.33	0.81	0.367	0.75
Origin (Migrant)	-0.42	0.47	0.80	0.371	0.66
Wealth	-0.46	0.36	1.57	0.210	0.63
Education	0.42	0.38	1.25	0.264	1.52
Age	-0.10	0.35	0.08	0.783	0.91
Occupation 1 (Domestic or Agriculture)	0.33	0.52	0.41	0.524	1.39
Occupation 2 (Tourism)	0.53	0.58	0.82	0.366	1.70
Caste 1 (Low)	0.61	0.42	2.05	0.152	1.83
Caste 2 (High)	0.21	0.59	0.12	0.725	1.23
Nagelkerke R Square	0.07				
N	187				
Missing cases	1				

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance.
Overall fit of predicted to observed results = 63.1%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

5.3.3 Distribution of Benefits by Costs

In order to determine if benefit distribution reflects conservation costs, the relationship between perceived level of benefit and each cost (crop loss, livestock depredation, resource dependency) was investigated using bivariate simple logistic regression. A negative relationship between crop loss and perceptions of benefit receipt was the only significant relationship found (Table 5.18). For each one point decrease on the ten-point crop loss scale, the odds that the respondent will perceive high levels of benefit are 1.3. A hierarchical logistic regression analysis, controlling for village category, suggested differences in perceptions of benefit receipt cannot be accounted for by regional distribution inequities; therefore, benefits are not distributed according to crop loss throughout the study area (Table 5.18). Resource dependency and livestock loss showed no relationship with a respondent's recognition of benefits (Table 5.18).

Table 5.18: Results of hierarchical logistic regression between costs and perception of benefit receipt, ACA (Q#14, 23, 54, 56)

Blocks	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>Odds Ratio*</i>	<i>Nagelkerke R Square</i>
<u>Block One</u>						
Crop Loss	-0.29	0.10	8.38	0.004	0.75	0.069
<u>Block Two</u>						
Crop Loss	-0.29	0.11	7.44	0.006	0.75	
Village Category (DVs)	-0.05	0.35	0.02	0.877	0.95	0.069
<u>Block Three</u>						
Crop Loss	-0.30	0.12	6.64	0.010	0.74	
Village Category (DVs)	-0.06	0.35	0.03	0.866	0.94	
Livestock Loss	0.03	0.20	0.02	0.888	1.03	
Resource Dependency	-0.01	0.08	0.02	0.897	0.99	0.070
N 170						
Missing cases 18						

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 57.1%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

5.3.4 Discussion

Personal benefits from conservation and development are perceived to some degree by all residents in lower Mustang. While regional inequities in the distribution of benefits are a common problem with IBPs (Barrett and Arcese 1995; Bookbinder et al. 1998; Ferraro 2001), the results show ACA does not display similar discrepancies in benefit distribution between villages within the protected area, as no differences are found between perceptions of benefits received in ORVs compared to DVs. These results are promising, suggesting IBPs can generate benefits that transcend regional boundaries and avoid concentration in one village only. However, despite the progress ACAP has made in delivering benefits to all villages within the conservation area, inequities still

exist between the rich and poor. Poor members of a community are not positioned to take advantage of benefits from, or participate in, conservation and development due to timing conflicts with daily subsistence activities (Colfer et al. 1999; Gupte 2003). While all residents in ACA admit to collecting resources, poorer households typically are occupied for a large portion of each day in resource collection. Also, results indicate poorer respondents suffer more from livestock depredation by protected wildlife, creating a substantial financial burden not easily compensated by social development projects intended to reach those not directly employed in tourism. Although the results suggest poor residents benefit less from IBPs in ACA, comments by respondents during interviews suggest ACAP has made progress in reaching marginalized residents by disbursing tourism entry fees throughout the conservation area to fund projects deemed necessary in the communities: “Now we also have equal benefits as rich people because everybody must get a permit to cut trees”, and “Things are improving for low-caste people like us. There is not as much disparity as there once was.” Although the research provides indications that the poor are better off than they were prior to ACA’s establishment, these results confirm common findings regarding benefit distribution in protected areas in developing countries (Wells and Brandon 1993; Goodwin and Roe 2001), and suggest that more needs to be done to ensure benefits reach disadvantaged residents. As indicated by respondents’ comments, limitations on access to resources and fees imposed for extraction from community forests appear to place more burden on poor members of communities and may account for perceived lower levels of benefit from the conservation area: “I do not like the community forest law of ACAP because poor people like us cannot get wood or trees without paying money, even though we are in the

middle of the jungle.” Apart from disparities in benefit distribution according to wealth, no other demographic variables were related to perceptions of benefit receipt.

Tourism is often criticized as an IBP for its inability to provide benefits throughout a community and an entire protected area (Barrett and Arcese 1995); however, the results presented in Figure 5.9 indicate the receipt of benefits from ACA does not depend on direct employment in tourism. While the economic benefits received through direct employment or participation in tourism are higher in DVs, tourism benefits have been extended indirectly to other areas. Approximately one-third of respondents recognize indirect benefits from tourism, indicating that residents realize the development and conservation projects conducted in their community derive from the revenue from tourist entry fees. Although some respondents indicate receiving no household benefits from tourism, these individuals still perceive similar levels of overall benefit from the conservation area as people directly employed in tourism. These results contradict typical criticisms of IBPs in the literature (Western 1994b; Pandit and Thapa 2004; Gadd 2005). Not only are benefits perceived equal across all villages in Mustang, but those not positioned to participate directly in tourism still perceive benefits from ACA. Although differences exist between villages in terms of involvement in tourism, because benefits are extended to those not employed in tourism, no differences between overall perceptions of benefit receipt exist.

Non-residents of protected areas have been found to dilute benefits intended for local communities, especially where tourism presents substantial economic opportunities (Ross and Wall 1999; Tisdell 1999; Sekhar 2003). The demand for secondary market, imported products by tourists partially limits the full integration of local producers into the local

tourist market. By regulating the tourism industry, ACAP has attempted to prevent a further loss of tourism revenue at the local level through the devaluation of the market from competitive pricing. Immigration to the ACA region does not appear to be affecting benefit receipt by indigenous residents. In fact, benefits do not appear to act as a significant attractant to the area, as indicated by the declining resident population. Although inferential statistics suggest the trend does not reflect the larger population, migrants were found to receive lower levels of benefit than people originally from the local area. The livelihood needs of recent migrants may not be met due to policies inhibiting their access to resources designed to protect local residents from the dilution of benefits; therefore, migrants may need to resort to illegal extractive activities. Although benefits should not be extended to migrants at the expense of indigenous residents, the livelihood needs of migrants must also be considered in IBPs given their ability to influence conservation objectives. Employment opportunities in ACA are not entirely captured by local residents, and are primarily restricted to lodge owners (Wells 1994; Brown et al. 1997). While research by Nepal et al. (2002) indicates porter jobs in the Everest region accrue to residents from other districts in Nepal, similar research has not been conducted on the origin of porters in ACA, or the portion of guiding employment opportunities captured by local residents. The selected sample in the present research did not include external beneficiaries; however, given their ability to affect conservation efforts within ACA, outsiders need to be considered in the distribution of benefits and design of IBPs.

Because fewer than half of the residents benefit from tourism, ACAP has the difficult task of distributing benefits to a large portion of the population. Social development

projects are frequently mentioned as benefits resulting from ACA, as these projects provide the primary method to extend tourism revenue to individuals and communities not employed in tourism. As indicated by the response patterns, residents perceive social development benefits to accrue to the community more so than the individual, suggesting the communal nature of these benefits. While collectively, social development projects may make meaningful contributions to a community, unless individual households are positioned to take advantage of a project (i.e., able to send children to a newly constructed school), these developments may provide few recognized benefits to households (McIvor 1997; Archabald and Naughton-Treves 2001).

The availability of resources for use is considered a benefit from the park and is the most frequent benefit mentioned by residents. While current levels of use are insufficient to meet local people's needs, restrictions on access are necessary as extraction levels required to fulfill needs may not be sustainable. However, deficiencies in current resource access may cause local people to have negative perceptions of the conservation area or illegally harvest resources to meet needs. While legal opportunities to extract resources exist in ACA, observations and discussions during field research suggest residents also participate in the illegal extraction of resources. During field research we noticed many trees were stripped of bark in order to create dead trees available for extraction. One village leader indicated that:

Since people know that they cannot cut live trees, some of the not-so-law-abiding villagers know how to kill trees without cutting them down. They take the bark off trees, which they use for roofing; and when the trees die, they cut them down and avoid penalty for cutting live trees.

Another study in Jaldapara Wildlife Sanctuary, India, concluded resource extraction was boosted by villagers using similar methods to purposely kill trees and return at a later

date to remove the trees from the forest (Dey 1997). Also, the widespread collection of wood indicates fuel conversion programs directed specifically at hotel operators may not be having the desired effect of altering resource use. One hotel owner indicated the expense of alternative energy sources to be the factor limiting conversion:

We cannot stay in this place without heat in winter. Gas and kerosene are expensive, which we cannot afford. Firewood is the only source of heat and cooking fuel. We need enough firewood.

In the northern portion of the study area, forests are too small to meet local needs and restrictions limit the amount of wood households can collect. To fulfill fuel needs, local people also use livestock dung and agricultural byproducts for cooking. People also indicate a desire to harvest medicinal herbs and live trees; however, at the time of this research, such activities were illegal. Based on interviews with ACAP authorities, experimental medicinal plant extraction projects were planned for future implementation. Extraction of certain medicinal herbs has proven to be unsustainable in other areas of Nepal due to extraction practices that preclude regeneration (Larsen 2002). Education will be a key feature of any IBP involving commercial harvesting of medicinal herbs in order to promote sustainable harvesting practices (Olsen and Larsen 2003).

Perceptions of intrinsic conservation values are not commonly associated with residents of protected areas in developing countries (Muller-Böcker and Kollmair 2000; Balmford and Whitten 2003); yet conservation benefits are indicated for households by a fifth of respondents and for communities by a third. Such findings may indicate an interesting trend in ACA, where local residents recognize the intrinsic value of conservation efforts in their area, and suggest educational efforts by ACAP have been

somewhat successful. However, intrinsic values do not extend to wildlife, and include only reforestation and forest conservation in general.

Mitigation benefits were mentioned by only a few respondents. While ACAP has initiated a number of mitigation projects to reduce wildlife damages, such as providing financial support for constructing livestock pens in barbwire, residents in Mustang do not recognize such efforts as benefits. Farmers must carry out personal mitigation measures by guarding crops overnight and scaring wildlife from fields during the harvest season. For the most part, reports indicate villagers do not kill offending wildlife; however, interviews with village leaders suggest retaliatory killing of wildlife did occur prior to a ban on firearms resulting from the political conflict. Also, reports of villagers killing monkeys were supported by sightings of observation platforms equipped with slingshots in crop fields. Some respondents indicated that since their Buddhist religious beliefs prohibited killing, villagers did not trap or kill wildlife; however, other studies have found Buddhist traditions do not curb poaching (Mishra et al. 2003). The conservation area does not provide a compensation scheme to cover damages caused by wildlife, resulting in a common complaint in ACA: “ACAP does not provide any compensation for us poor victims of wildlife depredation.” Despite the complaints regarding wildlife conflicts, only 15% of respondents cite mitigation measures as necessary for their community (Appendix 5.1). Given the widespread conflicts with wildlife, improvements to mitigation measures in ACA are necessary and could offer significant contributions to improving local attitudes toward wildlife.

The categories of benefits identified by respondents are the same in all villages, with the exception of participation. Participation benefits are recognized more frequently in

ORVs, suggesting the activities of ACAP have led to significant achievements in mobilizing remote communities. Participation is a fundamental component of the ACA approach, yet only a small portion of respondents overall recognize benefits from provisions for local participation in conservation and development. According to most residents who participate in conservation and development committees or groups, their participation provides more burdens than benefits, as shown by this comment from a respondent during a household survey interview: “I actually incur losses [from participating] as demands for social engagements prevent me from taking care of household chores and income-generating activities.”

Local residents of protected areas bear substantial costs in order to conserve natural resources (Norton-Griffiths and Southey 1995; Shyamsundar and Kramer 1996; Balmford and Whitten 2003). The most significant costs borne by residents in ACA are damages caused by wildlife, threats to human safety, increased cost of living, and restrictions on access to resources. Due to a higher number of people growing crops and involved in subsistence based agriculture, ORVs suffer most from crop loss. Indigenous residents, members of lower castes and people involved in agriculture as a livelihood are also found to experience more crop loss. Livestock losses are highest among the poor and respondents employed in tourism or agriculture. Resource dependency is universal and does not correspond with specific demographic characteristics; therefore ACAP must consider providing sufficient resources to meet the needs of the entire population. IBPs must ensure benefits reach those most affected by protected animals and restriction on resource access, otherwise IBPs will not create incentives to curb extractive activities (Metcalf 1994).

Although benefits are not entirely monopolized by elite and powerful hotel operators, and distribution across demographic variables appears for the most part equal, benefits are not distributed to those most affected by crop damage caused by wildlife. In fact, those experiencing the greatest losses of crops to wildlife benefit least. While benefits are distributed evenly among villages in ACA, benefits are not distributed to reflect an individual's level of costs. Resource dependency and livestock loss have no relationship with level of benefit; therefore, IBPs do not target those suffering the greatest consequences as a result of the conservation area.

Overall, ACA is providing benefits to local residents. The results suggest benefit distribution in ACA suggests benefits are not equally distributed according to wealth, with those facing difficulties meeting livelihood needs less likely to perceive benefits from conservation and development. Such inequities in benefit distribution could suggest the gap between the rich and poor is accentuated by IBPs in ACA; however, the recognition of even some benefit by the underprivileged indicates their wellbeing has been boosted. On a spatial scale, benefits are distributed equally across the region regardless of a village's location. ACA has successfully overcome the common shortcoming of IBPs by designing and distributing benefits to all villages within the protected area. However, IBPs are not targeted specifically to those experiencing the greatest costs from protected wildlife. In order for IBPs to address local concerns over restrictions and policies imposed by protected area regulations, the costs borne by local residents must be addressed.

5.4 Benefits and Costs – A Comparison between RCNP and ACA

Generalizations cannot be drawn on the superiority of one protected area over another in this study; however, keeping in mind their differences, relative comparisons between the protected areas can provide valuable insight on the achievements of each IBP.

Examining the differences between RCNP and ACA, in terms of perceptions and types of benefits recognized and conservation costs suffered by local residents, provides an indication of the efficacy of IBP distribution in each protected area.

Economic benefits are among the most common benefits from conservation and development recognized in RCNP (Table 5.19). While residents in both RCNP and ACA perceive economic benefits accrue more to the community than to the individual, significantly more residents in RCNP (56%) recognize household economic benefits than in ACA (18%). On the other hand, apart from extraction benefits, social developments are the most common benefits recognized by residents in ACA, with significantly more residents recognizing such benefits on the community level than in RCNP. In contrast to the personal economic benefits in RCNP, social development is perceived as primarily benefiting the community in ACA, and, does not contribute substantially to perceived levels of household benefits. These results reflect the contrasting approaches of the IBPs in RCNP and ACA: in RCNP, tourism provides opportunities for direct economic benefits, while in ACA, income earned from tourism is used in social development projects intended to benefit the community as a whole.

Table 5.19: Benefits identified by respondents for household and community in both protected areas (Q#64, 67)

Benefits	<i>Protected Areas</i>		χ^2	<i>df</i>	<i>p</i>	<i>Cramer's V</i>
	<i>RCNP</i>	<i>ACA</i>				
<u>Total Household</u>						
Economic	55.6%	17.6%	57.029	1	0.000	0.394 ^b
Social Development	33.9	40.4	1.469	1	0.225	-
Extraction	63.5	54.3	2.951	1	0.086	-
Conservation	15.3	16.0	0.000	1	0.982	-
Mitigation	5.3	1.6	2.835	1	0.092	-
Participation	11.6	9.0	0.434	1	0.510	-
<u>Total Community</u>						
Economic	76.2	43.6	40.303	1	0.000	0.332 ^b
Social Development	45.5	69.7	21.575	1	0.000	0.245 ^a
Extraction	72.0	58.0	7.491	1	0.006	0.147 ^a
Conservation	18.5	35.1	12.390	1	0.000	0.187 ^a
Mitigation	8.5	5.3	1.004	1	0.316	-
Participation	7.9	6.4	0.148	1	0.700	-
N	189	188				

Percentage based on total number of respondents including those who gave no response. Percentages do not equal 100% because people were allowed to provide more than one response. Chi-square test results not provided when more than 20% of cells have expected cell frequencies less than 5. Cramer's V values only provided for significant relationships. Associations indicated by Cramer's V: ^alow, ^bmoderate.

Differences between RCNP and ACA in perceived levels of household benefits from conservation and development stem from differences between types of household and community benefits recognized in each protected area (Table 5.20). Overall, the level of benefits perceived by residents in RCNP and ACA is equal, indicating each protected area delivers comparable benefits through IBPs. However, comparisons between DVs in each protected area reveal DVs residents in RCNP perceive significantly more benefits than residents in DVs in ACA. This result can be explained by the greater involvement in the tourism industry in RCNP, especially in DVs.

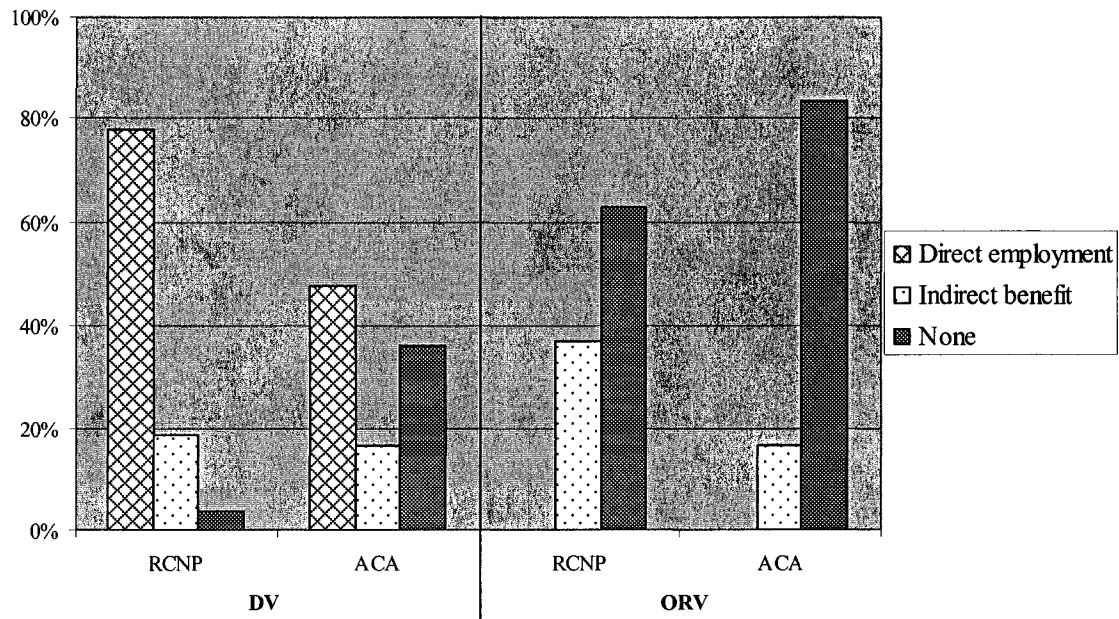
Table 5.20: Perceptions of benefits and cost comparison between RCNP and ACA (Q#13, 22, 54, 56, 63A, 66A)

	z / χ^2	p	Relationship
<i>Between protected areas</i>			
Perceptions of Benefit Receipt ^a	-1.21	0.227	NS
Crop Loss ^b	28.64	0.000	RCNP > ACA (V = 0.301) ^d
Livestock Depredation ^b	6.70	0.010	ACA > RCNP (V = 0.156) ^c
Resource Dependency ^a	-5.43	0.000	ACA > RCNP
<i>Destination Villages</i>			
Perceptions of Benefit Receipt ^a	-3.89	0.000	RCNP > ACA
Crop Loss ^b	6.55	0.010	RCNP > ACA (V = 0.229) ^c
Livestock Depredation ^b	1.12	0.290	NS
Resource Dependency ^a	-5.69	0.000	ACA > RCNP
<i>Off-Route Villages</i>			
Perceptions of Benefit Receipt ^a	-1.03	0.305	NS
Crop Loss ^b	16.34	0.000	RCNP > ACA (V = 0.311) ^d
Livestock Depredation ^b	8.85	0.003	ACA > RCNP (V = 0.237) ^c
Resource Dependency ^a	-3.15	0.002	ACA > RCNP

Results of ^aMann-Whitney and ^bChi-square tests. NS = non significant. Associations indicated by Cramer's V: ^clow, ^dmoderate.

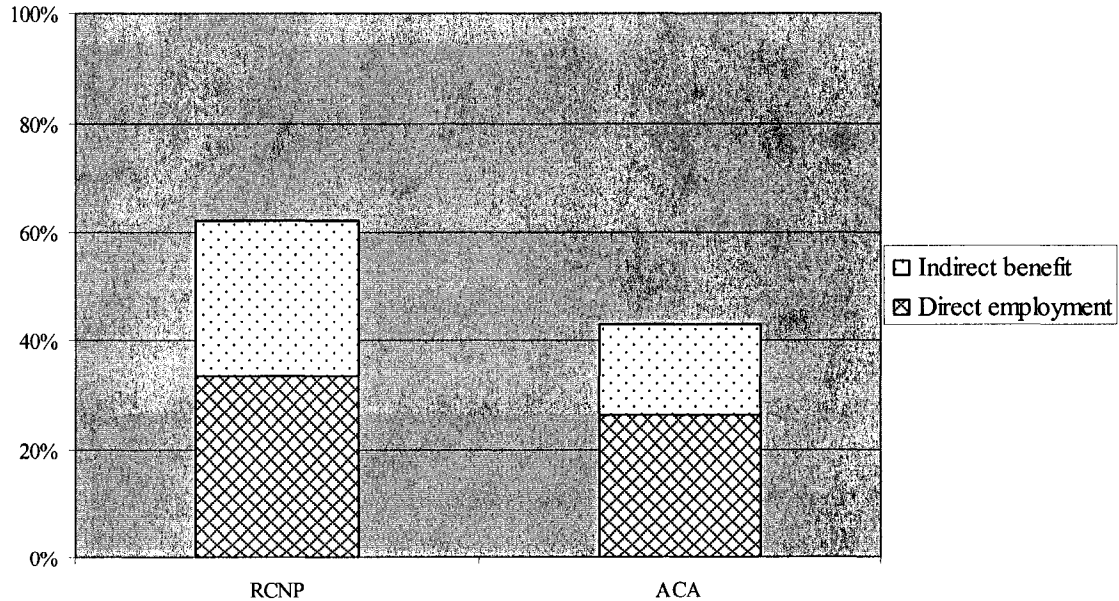
Figure 5.13 shows the differences between the protected areas and level of tourism participation in DVs and ORVs. Almost one-third as many DV residents in RCNP benefit from tourism as in ACA; however, indirect benefits are recognized by the same number of respondents. Comparisons of tourism benefits in ORVs reveal that while neither protected area offers direct tourism benefits in ORVs, twice as many ORV residents in RCNP recognize indirect benefits as in ORVs in ACA. Compared to ACA, tourism in RCNP provides benefits to many people, including those not directly employed in tourism, and direct employment in tourism in DVs leads to higher levels of household benefits recognized by residents. The differences between protected areas and the level of participation in tourism overall are significant (Figure 5.14). RCNP not only provides greater tourism benefits than ACA, but indirect benefits are extended to a larger portion of residents.

Figure 5.13: Tourism benefit by protected area and village category (Q#3, 76G,I)



Chi-square tests reveal significant differences between protected areas in DVs ($\chi^2 = 28.553$, $V = 0.394$, $p < 0.0001$) and ORVs ($\chi^2 = 8.990$, $V = 0.227$, $p < 0.003$).

Figure 5.14: Perceptions of tourism benefit receipt in both protected areas (Q#3, 76G, I)



Chi-square tests reveal significant differences between protected areas in overall perceptions of benefits from tourism ($\chi^2 = 11.693$, $V = 0.184$, $p < 0.001$) and indirect benefits ($\chi^2 = 7.812$, $V = 0.150$, $p < 0.005$). Direct benefits are not significantly different between protected areas ($\chi^2 = 2.050$, $p < 0.2$).

RCNP and ACA experience significantly different consequences as a result of conservation in terms of damages caused by wildlife and restrictions on access to resources (Table 5.20). Crop loss was experienced by a significantly larger portion of residents in RCNP overall, including both DVs and ORVs. While livestock depredation was equally common in DVs in RCNP and ACA, reports of livestock depredation were higher overall in ACA. Although residents in ACA are significantly more dependent on resources from the conservation area than residents in RCNP, differences in resource dependency cannot be used as a cost comparison of restrictions on resource access because resource use in ACA has fewer legal restrictions than in RCNP. Essentially conflicts with wildlife are the only measures able to provide somewhat of a comparison between costs experienced in RCNP and ACA. Crop loss is a more common occurrence in RCNP, while livestock depredation occurs more frequently in ACA.

5.5 Conclusion

IBPs in RCNP and ACA have delivered recognizable benefits to local inhabitants. Inequities in benefit distribution are primarily on a regional scale in RCNP, with DVs perceiving more benefits than ORVs. However, comparisons with levels of benefit perceived in ORVs in ACA, where benefits are equal on a regional level, suggest the relative overall receipt of benefits in ORVs in RCNP is higher. The difference in distribution across villages is due more to higher levels of benefit from tourism in DVs in RCNP. Although regional inequities are not a concern in ACA, poor respondents recognize fewer benefits than wealthy respondents.

Interestingly, although residents in RCNP benefit more from tourism than ACA residents, the perceptions of benefit receipt are the same between the two protected areas overall (see Table 5.20). In fact, tourism in RCNP creates divisions in the levels of benefit perceived by individuals whereas distribution in ACA compensates for limited opportunities to participate in tourism as indicated by equal benefit recognition across all levels of participation in tourism (none, indirect, direct, cf. Figures 5.3 and 5.9). Regardless of the type of tourism benefit in ACA, all residents recognize the same level of benefits. In RCNP, the level of benefits recognized by a respondent increases as their participation in tourism becomes more direct.

Neither RCNP nor ACA has been able to distribute benefits according to costs. In both protected areas, those experiencing the greatest crop loss benefit the least from conservation and development, while those suffering most from livestock depredation and depending most on resources do not receive more benefits than those not experiencing these consequences. While discrepancies between crop loss and benefit distribution in RCNP can be explained by varying levels of benefit receipt between villages, in ACA the discrepancy is not due to regional inequities and reflects an overall flaw in the targeting of IBPs.

This chapter examined the distribution of benefits surrounding RCNP and within ACA. The categories and amount of benefits identified by local people were reviewed and provided an indication of local recognition of IBPs. The appropriateness of benefit distribution was determined in relation to conflicts with wildlife, an individual's dependency on natural resources, and demographic characteristics. The discussion has shown that ensuring the replication of IBPs on a regional level and across all

demographic groups is difficult to achieve. In addition, benefits do not necessarily accrue to those most affected by and most likely to impact conservation objectives. The following chapter examines if benefit programs are linked to conservation outcomes and how linkage and overall perception of benefits affect local attitudes toward conservation.

Chapter 6: Results – Linking Livelihoods to Conservation

6.1 Introduction

While calls for social justice in addressing the costs borne at the local level have been partially responsible for the move towards incorporating benefits in protected area management, the underlying additional intent is to offer benefits as an incentive to encourage voluntary local support and stewardship in order to achieve resource conservation goals (Groom et al. 1999). Much of the literature on conservation attitudes in developing countries indicates local residents hold favourable attitudes toward conservation in general (Gillingham and Lee 1999; Mehta and Heinen 2001; Walpole and Goodwin 2001; Bauer 2003). These attitudes may not necessarily accurately reflect local residents' perceptions, and perhaps indicate a flaw in the use of quantitative survey methods centred on western values of nature to measure conservation attitudes (Shyamsundar and Kramer 1996). While residents may hold favourable views toward protecting plants and wild animals, they may not support active conservation efforts encompassing their community or impacting their livelihood. Even if conservation efforts are supported, local residents may have poor relationships with the management authority, and disagree with their management approach (Ite 1996; Van Den Born et al. 2001; Bauer 2003). Attitudes toward protected area management do not follow a similar pattern of universal positive response, and provide an alternative measure against which to evaluate the impact of IBPs on attitudes, and perhaps a more appropriate measure for the context of developing countries (Ite 1996; Bauer 2003).

Research suggests the receipt of benefits corresponds with improved attitudes toward conservation (de Boer and Baquete 1998; Gillingham and Lee 1999; Abbot et al. 2001;

Goodwin and Roe 2001; Mehta and Heinen 2001; Bauer 2003; Sekhar 2003). Yet for benefits to act as incentives, a direct link must be established between the protection of natural resources and the development, social advancement or income-earning opportunities offered and supported by conservation institutions (Alpert 1996; Salafsky and Wollenberg 2000; Brown 2002). Establishing a theoretical link does not necessarily guarantee local residents will support conservation efforts; benefits can only function as incentives and alter local attitudes toward resource protection if local residents actually perceive a link between livelihoods and conservation (Noss et al. 1999; Salafsky and Wollenberg 2000). Tourism has been cited as ideally suited to offer clearly defined and well-established linkages to local livelihoods; however, some research suggests that unless residents receive direct benefits from tourism, the linkage is overlooked and not understood (Walpole and Goodwin 2001; Gadd 2005). Essentially, the intention of incentive-based conservation is to create a dependency between conservation and livelihoods in order not only to encourage support for conservation of natural resources but to create a long term commitment to conservation. If this linkage cannot be established, then the program is simply a development project, and does not contribute to conservation (Tello et al. 1998).

This chapter examines local attitudes of residents surrounding RCNP and within ACA in relation to benefits and perceptions of the link between livelihoods and conservation. First, attitudes are analyzed by an examination of respondents' perceptions toward resource conservation, the protected area itself, and the institution responsible for management. Combining the questions on attitudes toward conservation and the protected area in general to create a scale for measuring attitudes is not possible due to

overwhelming positive response and inconsistency of responses based on nuances within each protected area. As a result, a scale was only developed to represent attitudes toward protected area management. Next, relationships between benefits and perceptions of direct linkage are identified to provide an indication of linkage recognition. Finally, benefits are compared with scores on the attitude scale and the effect of linkage is explored. Since Chapter 5 has already explored benefit distribution across villages, village category is not included in comparisons between benefits and linkage and attitude. The intention of this chapter is not to revisit benefit distribution, but to examine the relationships between perceptions of benefits, perceptions of linkage, and attitude. Frequency distributions of attitudes toward resource conservation, the protected area, and policies are presented and compared as between villages, and scores on the scale reflecting attitudes toward protected area management are compared as between villages.

6.2 Royal Chitwan National Park

6.2.1 Attitudes

Attitudes toward conservation in RCNP will be examined on three levels: resource conservation, national park, and park management.

Attitudes Toward Resource Conservation

Support for the protection of plants and wildlife in RCNP was widespread (Table 6.1). Almost all residents agreed with the need to protect plant species in the park; however, they assert the need to protect does not negate the right for residents to collect forest resources. In fact, 46% of respondents believe local residents should be able to collect plants and trees from the park, leaving only 53% of residents in support of strict resource protection. Comparisons between village categories reveal ORV residents

indicate preferences toward forest resource extraction significantly more than residents from DVs. The majority of respondents recognize the need to protect populations of wild animals, support hunting restrictions, and penalties for poachers. Despite overall support for forest and wildlife conservation, 20% of respondents indicate conservation is a waste of time and money. Only 42% of respondents support both forest and wildlife conservation in general. Residents in ORVs are significantly more likely to believe conservation is a waste of time and money. Overall, however, almost all respondents agree that it is good that the area is protected.

Table 6.1: Attitudes toward resource conservation, RCNP (Q#35)

Statements	Total	Villages	
		Destination	Off-Route
It is important to protect the plant species in the park. (n = 188)	99.5%	100.0%	99.1%
It is important to protect the wild animal species in the park. (n = 189)	98.4	100.0	97.2
It is a waste of time and money to conserve forests and wildlife. ^a (n = 185)	20.5	5.1	32.1
People should be able to hunt in the park. (n = 189)	3.7	1.2	5.6
People should be able to collect plants and trees from the park. ^b (n = 188)	46.3	33.8	55.6
People who poach should be punished. (n = 188)	98.9	100.0	98.1
It is good this land is protected. (n = 188)	98.9	97.5	100.0
	N	189	81
		108	

Percentages represent those in agreement with the statement, and are based on total number of respondents excluding missing cases. Missing cases = (189 - n) for each statement. Chi-square tests reveal significant differences between villages ($\chi^2 = 18.615$, $p < 0.0001$, $V = 0.331$)^a and ($\chi^2 = 7.934$, $p < 0.005$, $V = 0.216$)^b.

Attitudes Toward National Park

Support for the national park was very high. Respondents were asked the open-ended question: 'Do you see a need for the park to exist?' (after Ite 1996). Responses were classified as positive or negative, with 93% of respondents indicating a positive response.

Respondents were asked to elaborate on the reasons they support the park (see Table 5.1). Following personal benefit, the conservation of plants, wildlife, and future use options were cited most frequently. Bivariate analysis revealed significant relationships between villages and plant conservation, and between villages and future use options, with ORVs more likely to cite these reasons to support the park. DV residents were significantly more likely to indicate wildlife and tourism as reasons to support the park.

Three attitude statements were used to examine local attitudes toward the national park (after Mehta and Heinen 2001). Overall, the results indicated overwhelming support (Table 6.2); however, comparisons between villages indicate that although residents in ORVs like the park and feel it was created for the betterment of their community, 31% of respondents are unhappy that the park borders their village.

Table 6.2: *Attitudes toward national park, RCNP (Q#39)*

Statements	Total	Villages	
		Destination	Off-Route
The park was created for the betterment of our community. (n = 178)	81.5%	90.3%	82.4%
I am generally satisfied that my village borders the park. ^b (n = 188)	79.8	93.8	69.2
Generally speaking, I like the park. (n = 185)	95.7	96.2	95.3
	N 189	81	108

Percentages represent those in agreement with the statement, and are based on total number of respondents excluding missing cases. Missing cases = (189 - n) for each statement. ^bChi-square tests reveal significant relationship with village ($\chi^2 = 15.899$, $V = 0.304$, $p < 0.0001$).

Attitudes Toward Park Management

Although support for the park and resource conservation was high, respondents did not hold similar attitudes toward the park management (Table 6.3). Seven attitude statements were combined to form a scale indicating attitudes toward park management.

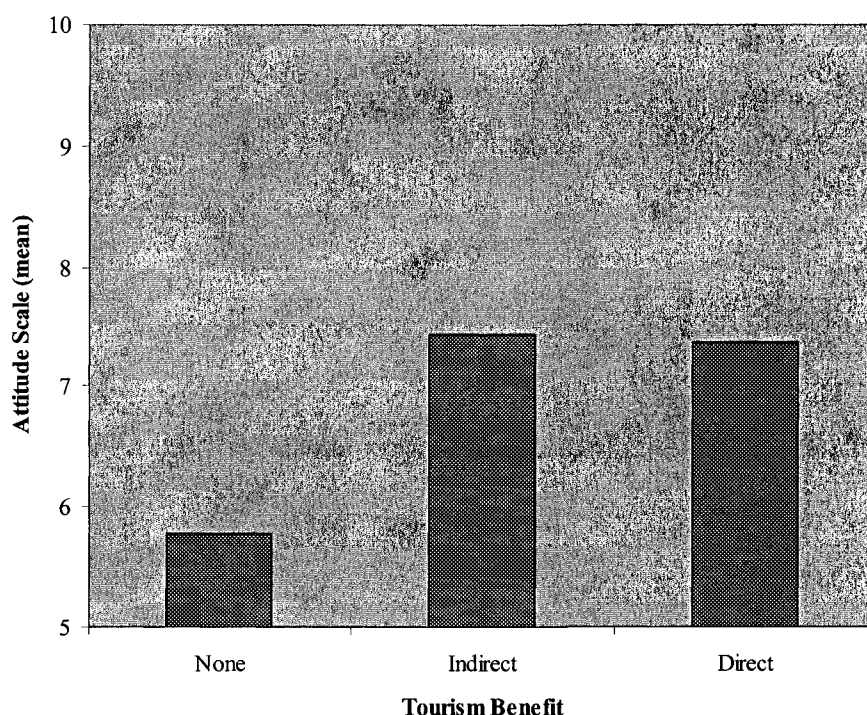
Table 6.3: Attitudes toward park management, RCNP (Q#78)

The protected area authorities...	<i>Positive</i>	<i>Negative</i>	<i>Don't Know</i>
...are generally helpful and understand our problems, needs and expectations.	67.2%	27.0%	5.8%
...are not interested in our needs or concerns.	51.9	44.4	3.7
...are open to our suggestions and concerns regarding development and conservation programs.	69.8	22.8	7.4
...treat us as equal partners in development and conservation.	67.7	25.4	6.9
...don't understand our problems and needs.	50.3	47.6	2.1
...encourage us to participate in conservation and development programs.	81.5	15.9	2.6
...don't respect our input or appreciate our efforts.	57.7	30.7	11.6
Scale mean ^a	6.81		
Standard deviation ^a	3.06		
N ^a	182		
Missing cases ^a	7		

Percentages are based on total number of respondents. Statements were used to create a scale to measure attitudes. ^aSummary of scale details. Respondents were asked to agree or disagree with a statement. For negative worded statements, disagree corresponded with a positive response. Respondents were assigned a score of 1 for positive responses and 0 for negative responses. Based on a 1 - 10 scale, a high mean score indicates a positive attitude.

The mean scale score on a ten-point scale was 6.8 (with 10 representing a high score), and no difference was found between villages ($Z = -1.08$, $p < 0.3$). Attitudes toward park management are significantly more positive among respondents involved in the tourism industry (Figure 6.1). Perceptions towards park policies did not significantly differ between villages (Table 6.4). Half of respondents rated policies on wild animal conservation, community forestry and community development as 'good', yet only 32% considered park policies to be 'good' overall.

Figure 6.1: Attitude by tourism benefit, RCNP (Q#3, 76G, I, 78)



Results of Kruskal-Wallis show differences are significant ($\chi^2 = 10.340$, $df = 2$, $p < 0.006$). Results are not separated by village category as the relationship of interest is how benefits from tourism influence attitudes, not how inequities in the distribution of tourism benefits throughout the region affect attitudes. Inequities in benefit distribution are discussed in Chapter 5.

Table 6.4: Perceptions of park policies, RCNP (Q#41, 42, 43, 44)

How would you rate the park's policy...	<i>Good</i>	<i>Okay</i>	<i>Bad</i>	<i>Don't Know</i>
... on wild animals conservation?	49.2%	42.3%	3.2%	5.3%
... on community development?	45.0	43.9	3.7	7.4
... on community forestry?	54.0	39.7	2.1	4.2
... overall?	31.7	54.0	8.5	5.8
N	189			

Differences within sample significant at the < 0.0001 level. Chi-square tests reveal no differences between villages.

6.2.2 Linkage

To determine if program benefits in RCNP link local livelihoods to conservation, the level of benefits perceived was compared to scores on the linkage scale. Because of the perceived ability of tourism development to establish strong linkages between livelihoods and resource conservation, linkage scores were also evaluated based on the type of benefit received from tourism (direct or indirect). The average score on the linkage scale in RCNP was 6.5 out of 10, with 10 representing a high score. A logistic regression analysis was employed to examine the relationship between perceptions of benefits and linkage (Table 6.5). Perceptions of benefits and type of tourism benefit were found to have significant effects on an individual's perception of linkage. For each one-point increase on the ten-point benefit receipt scale the odds that the respondent will perceive high linkage increases by 1.3. The variables created for type of tourism benefit indicate odds ratios of 10.3 for direct tourism benefits and 5.9 for indirect tourism benefits, when

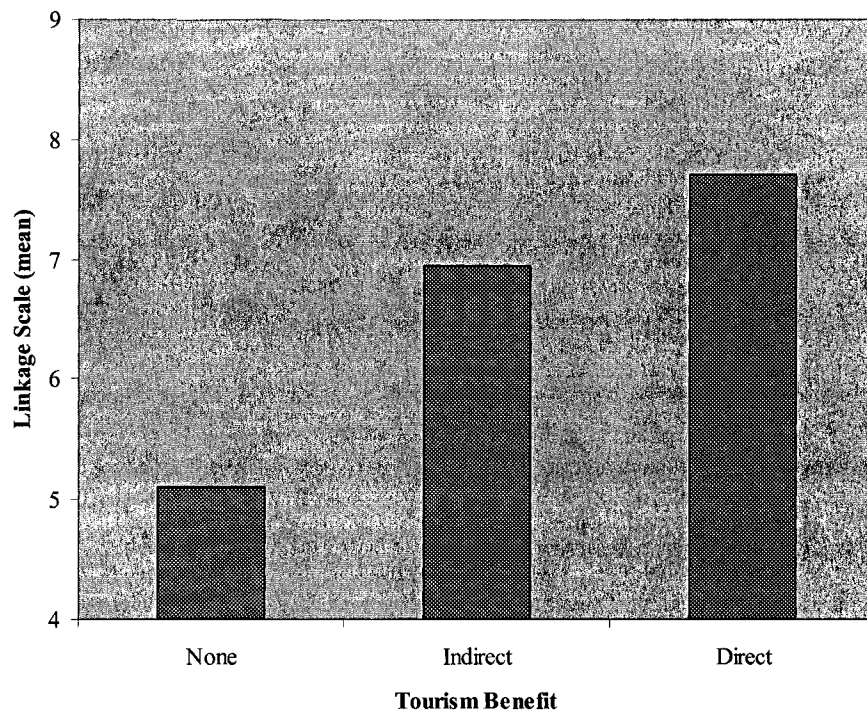
Table 6.5: Results of logistic regression between respondent's perception of benefit receipt and perception of linkage between livelihood and park, RCNP (Q#3, 61B, D, E, H, J, 76G, I, 77)

Benefits	B	SE	Wald	p	Odds Ratio*
Perception of benefit receipt	0.29	0.09	9.72	0.002	1.34
Direct Tourism Benefit	2.34	0.46	26.01	0.000	10.34
Indirect Tourism Benefit	1.77	0.43	16.87	0.000	5.88
Nagelkerke R Square	0.38				
N	178				
Missing cases	11				

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 73%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

all other variables are equal. The bar graph displayed in Figure 6.2 is useful in understanding the relationship between linkage and tourism benefit. Residents indicating no benefits from tourism have the lowest mean score on the linkage scale. Linkage scores increase for those indirectly benefiting from tourism, and are highest among respondents directly benefiting through employment in tourism.

Figure 6.2: *Perception of linkage by tourism benefit, RCNP (Q#3, 61B, D, E, H, J, 76G, I, 77)*



Results of Kruskal-Wallis show differences are significant ($\chi^2 = 47.519$, $df = 2$, $p < 0.0001$). Results are not separated by village category as the relationship of interest is how benefits from tourism influence linkage perceptions, not how inequities in the distribution of tourism benefits throughout the region affect linkage perceptions. Inequities in benefit distribution are discussed in Chapter 5.

6.2.3 Attitudes, Linkage and Benefits

The attitude scale created facilitates logistic regression analysis to measure associations between attitudes towards park management, receipt of benefits, and linkage with local livelihoods. First, bivariate simple logistic regression was used to determine

the effect of perceptions of household benefit receipt on attitudes. The analysis revealed a significant positive association between perceived benefits and attitudes, with attitudes toward park management improving as benefits increased at an odds ratio of 1.3 (Table 6.6). Using hierarchical logistic regression, linkage was entered into the second block to explore the relationships among attitudes, benefits and linkage (Table 6.6). By adding linkage scale scores to the equation, the association between benefits and attitude became insignificant, indicating a respondent's perception of the link between their livelihood and conservation had a greater effect on attitudes toward park management than benefits. As a respondent's linkage perception increases, attitudes toward park management improve at an odds ratio of 1.4.

Table 6.6: Results of hierarchical logistic regression between attitudes and perception of benefit receipt and perception of linkage, RCNP (Q#61B, D, E, H, J, 63A, 66A, 77, 78)

Blocks	B	SE	Wald	p	Odds Ratio*	Nagelkerke R Square
<u>Block One</u>						
Perception of benefit receipt	0.27	0.08	12.22	0.000	1.31	0.101
<u>Block Two</u>						
Perception of benefit receipt	0.15	0.09	3.01	0.083	1.16	
Perception of linkage	0.32	0.09	12.45	0.000	1.38	0.197
N	172					
Missing cases	17					

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 65.7%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

6.2.4 Discussion

Residents living in the buffer zone of RCNP recognize the flora and fauna of the national park are linked to their livelihoods and the benefits they receive, and as a result, the attitudes of those benefiting are positive. The major factor inhibiting the ability of IBPs in RCNP to alter extractive behaviours of all residents is the inability to deliver benefits throughout the population surrounding the park (Chapter 5). Those receiving no benefits do not link livelihoods with conservation, and, therefore, have no incentive to conserve resources amidst the consequences of park-imposed access restrictions and wildlife damage. Consequently, despite success in establishing a perceived direct connection between benefits and livelihoods, residents surrounding RCNP continue to disregard legal restrictions on resource collection.

While widespread local support for forest and wildlife conservation was demonstrated from the survey results, response patterns indicate residents only support conservation for personal and community use and benefit options, and do not favour the strict protection typical of national parks. Support for forest conservation is indicated to be contingent on options for current and future use by almost half of the population, while residents in villages receiving fewer benefits from the park are more likely to think financial investments in conservation could be better used elsewhere, as indicated by this comment made during an interview with an ORV resident: “The park revenue should be used to solve critical problems such as flood control, rather than throwing it away on so-called community programs.” Such conditional conservation support has been described in other protected areas around the world (Fiallo and Jacobson 1995; Ite 1996; Bauer 2003).

Among villages within and surrounding Machalilla National Park, Ecuador, widespread recognition of the importance of forest conservation for future generations was indicated, yet most villagers still wanted to collect firewood from the park (Fiallo and Jacobson 1995). A similar scenario was identified in Waza National Park, Cameroon, where respondents felt the park was too large despite an expressed appreciation for its existence (Bauer 2003). A study on attitudes toward wetland conservation in Nepal also found extensive support, yet residents condemned restrictions on resource extraction (Sah and Heinen 2001).

Reasons provided in support of RCNP's existence coincide with perceived benefits from the park. Given the high levels of resource dependency and significance of extraction benefits, villagers in ORVs recognize the important role of the park in forest conservation and ensuring resource use options for future generations. The economic benefits provided by the tourism market in DVs explain the importance placed on the park's role in wildlife conservation and tourism by DV residents. Participation in wildlife-based tourism has also been shown to lead to support for wildlife conservation in other surveys (Weber 1995; Hamilton et al. 2000; Archabald and Naughton-Treves 2001; Gadd 2005). Overall, residents in DVs are quite supportive of the national park, and are pleased to live on its border. Although supportive of the park, residents from ORVs are not as happy their villages are located near the park boundary, suggesting the benefits of resource conservation do not outweigh the costs from crop damage caused by wild animals.

While residents surrounding RCNP acknowledge the need to conserve natural resources and support the conservation role of the park, attitudes towards park

management and policies are less favourable. The individual questions used in the attitude scale suggest some respondents do not believe the DNPWC is concerned with the needs and problems of local people and the DNPWC does not value the role of local people in conservation. Distaste over park policies does not indicate lack of support for conservation: rather, residents have concerns over the current management approach. The primary concerns voiced were different in DVs and ORVs. Many residents in DVs voiced concerns over the failure of the DNPWC to curb poaching and provide adequate facilities for tourists within the park. In ORVs, negative attitudes toward park management are often associated with the park's inability or indifference to limit human-wildlife conflicts.

In RCNP, residents are aware of the importance of the park to their community, with most people recognizing benefits from the park also perceiving a direct link between conservation and livelihoods. Local perceptions of linkage are captured in this statement expressed during an informal conversation with an ORV resident:

It is a good thing to protect forest and wild animals. These are our wealth and we are responsible for protecting them. We get grass, fodder, firewood, and other forest resources by protecting the forests. In addition, we also enjoy the privilege of viewing rare wild animals. It is because of the tourists that Sauraha is what it is today.

The more benefits a respondent receives, the more likely a link between livelihood and conservation will be recognized. The type of benefit received from tourism is associated with a respondent's perception of a link between conservation and livelihoods. The identification of tourism benefits by households not directly employed in tourism does not necessarily suggest they recognize a link between benefits and conservation.

Although indirect tourism benefits derive from the park, respondents may not recognize

the link between resources and tourism. However, those respondents who benefited from tourism did recognize a link between conservation and their livelihood more than those without such benefits. Direct tourism benefit through employment leads to a stronger likelihood a respondent will recognize a link than indirect benefits, although the association between linkage and indirect benefits remains high. Indirect benefits do not lead to the same level of linkage with conservation objectives as direct employment. This result is to be expected given the economic contribution of employment to household income versus indirect benefits such as social services or a market for agricultural products. Tourism to RCNP is inherently linked to conservation because the primary attraction is the opportunity to view endangered wild animals in their natural habitat (Damania and Hatch 2005). While the perception of a link between conservation and livelihoods is not expected to be more likely among respondents receiving indirect tourism benefits, the results suggest RCNP has established IBPs with clear linkages to conservation. Provided local residents recognize some form of benefit from the park, respondents will perceive such benefits are a result of conservation efforts in the park.

Higher levels of benefit receipt in communities surrounding RCNP correspond with positive attitudes toward park management, and, as tourism benefit becomes more direct, attitudes also increase. Although benefits have been found to lead to more positive attitudes in many cases (Fiallo and Jacobson 1995; de Boer and Baquete 1998; Hamilton et al. 2000; Abbot et al. 2001; Archabald and Naughton-Treves 2001; Jim and Xu 2002; Sekhar 2003; Stem et al. 2003; McClanahan et al. 2005), such a relationship depends on a perceived link between the benefits received and the conservation of natural resources (Bauer 2003; Gadd 2005). The results indicate a direct link between conservation and

local livelihoods leads to high levels of support for the park. The relationship between linkage and attitudes as perceived by local residents can be understood from the following two statements by residents in a DV:

We need the park for a lot of reasons. We now depend on the park so much that we cannot live without it. This entire village lives on income from tourism. We also need it to protect the forests.

I like the park very much because if there was no park then we could not see these disappearing wild animals. The park has developed tourism, so that we local people get benefits in direct and indirect ways, such as getting jobs and doing business in local products like vegetables, milk, etc.

These findings corroborate other studies (Gadd 2005), and support the relationship between linkage and attitudes. As an individual's perception of a link increases the likelihood the individual has a favourable attitude towards park management also increases.

The overwhelming positive support voiced for conservation did not coincide with conduct. IBPs based on perceived direct linkages with local livelihoods may lead to improved attitudes toward protected areas and conservation in general, but unless benefits outweigh the opportunity costs of conservation, IBPs will not guarantee an abandonment of behaviours in conflict with conservation objectives (Kremen et al. 2000; Barrett et al. 2001). One villager summarizes how cost-versus-benefit considerations influence local actions: "Villagers can be both poachers and guardians of the park, depending on which benefits them more." Personal observations, survey results and accounts from villagers confirm the widespread occurrence of poaching by individuals for personal use or economic return. Poaching in RCNP is often carried out to fulfill subsistence needs of local people, including the collection of forest products for house construction, livestock fodder, and consumption. Wild animals, particularly wild boar and birds, are trapped for

household consumption, and are often shared with community members to discourage reporting violations of park or community forest regulations to authorities. During field research in an ORV, the research team was invited to a community picnic where an illegally poached wild boar was to be served. Some villagers reported the collection of wild peacock eggs, which was confirmed by personal observations of peacocks as household pets. Many villagers admitted to illegally catching fish in the river by using poison. Poaching is not limited to small-scale extraction for use. Villagers and park authorities report poaching by poor local residents for organized parties involved in trade in animal body parts. Such incongruence between stated support for conservation and poaching has been found in other studies around RCNP (Nepal and Weber 1993).

Observations of illegal collection of resources increased during Maoist imposed strikes. During strikes, the army is preoccupied with minimizing political turmoil, thereby reducing the presence of guards in the park. Residents, normally afraid of fines and imprisonment, take advantage of the lower likelihood of being caught, and hundreds of people can be seen collecting resources on these days. Enforcement, not benefits, appears to be the incentive keeping some residents from extracting resources from the park. Despite the linkage established between livelihoods and conservation in the RCNP buffer zone, overall a tragedy of commons scenario is occurring with villagers condemning poaching while, at the same time, openly admitting to participating in poaching.

Respondents receiving benefits in RCNP recognize a link between livelihoods and conservation. While this perception of a link leads to improved attitudes among those

receiving benefits, some residents do not receive sufficient levels of benefit, and therefore perceive no link, have less favourable attitudes toward park management, and consequently, engage in activities detrimental to conservation. The success of IBPs in RCNP is inhibited by the inability to distribute sufficient benefits throughout the buffer zone.

6.3 Annapurna Conservation Area

6.3.1 Attitudes

Attitudes toward conservation in ACA will be examined on three levels: resource conservation, conservation area, and conservation area management.

Attitudes Toward Resource Conservation

Respondents in ACA unanimously support the need to protect plant species (Table 6.7). Recognition of the importance of forest conservation does not, however, indicate support for prohibitions on resource use, with 62% of respondents defending resource extraction in the conservation area. Comparisons between villages reveal DV residents indicate the importance of wildlife conservation significantly more than residents from ORVs. The majority of respondents recognize the need to penalize poachers, yet 28% support hunting. Overall, the majority of respondents agree that it is good that the area is protected.

Attitudes Toward Conservation Area

Support for the conservation area was high. Respondents were asked the open-ended question: ‘Do you see a need for the conservation area to exist?’ (after Ite 1996). Responses were classified as positive or negative, with 77% of respondents indicating a

Table 6.7: Attitudes toward resource conservation, ACA (Q#35)

Statements	Total	Villages	
		Destination	Off-Route
It is important to protect the plant species in the conservation area. (n = 188)	100.0%	100.0%	100.0%
It is important to protect the wild animal species in the conservation area. ^a (n = 187)	88.2	95.1	79.8
It is a waste of time and money to conserve forests and wildlife. (n = 181)	6.6	6.9	6.3
People should be able to hunt in the conservation area. (n = 178)	27.5	21.2	35.4
People should be able to collect plants and trees from the conservation area. (n = 178)	61.8	60.2	63.8
People who poach should be punished. (n = 183)	96.2	98.0	93.8
It is good this land is protected. (n = 185)	97.3	97.1	97.6
	N 188	103	85

Percentages represent those in agreement with the statement, and are based on total number of respondents excluding missing cases. Missing cases = (188 - n) for each statement. ^aChi-square tests reveal differences between villages ($\chi^2 = 9.118$, $p < 0.001$, $V = 0.238$).

positive response. Respondents were asked to elaborate on the reasons they support the conservation area (see Table 5.10). Following personal benefit, the conservation of plants and wildlife were cited most frequently. Bivariate analysis revealed a relationship between villages and the importance placed on plant protection. ORVs are significantly more likely to cite the need to conserve plants in support of the conservation area than are DVs. Tourism was not a common reason for supporting ACA. Three attitude statements were used to elaborate on local attitudes toward the conservation area (after Mehta and Heinen 2001). Overall, the results indicated overwhelmingly favourable support (Table 6.8).

Table 6.8: Attitudes toward conservation area, ACA (Q#39)

Statements	Total	Villages	
		Destination	Off-Route
The conservation area was created for the betterment of our community. (n = 176)	92.6%	90.7%	94.9%
I am generally satisfied that my village is included in the conservation area. (n = 182)	93.4	94.1	92.6
Generally speaking, I like the conservation area. (n = 187)	97.3	95.1	100.0
	N	188	103
		85	

Percentages represent those in agreement with the statement, and are based on total number of respondents excluding missing cases. Missing cases = (188 - n) for each statement. Chi-square tests reveal no significant differences between villages.

Attitudes Toward Conservation Area Management

Attitudes toward conservation area management were not as positive as attitudes toward ACA and resource conservation (Table 6.9). Attitudes toward conservation area management were measured by six attitude statements combined to form a scale. The mean scale score on a ten-point scale was 8.2 (with 10 representing a high score), and no difference was found between villages ($Z = -0.01$, $p < 1$). The relationship between attitudes and the type of tourism benefit indicated was insignificant. Figure 6.3 shows attitudes remain relatively constant regardless of the type of involvement in the tourism industry. Perceptions toward park policies were varied (Table 6.10). Slightly more than half of respondents rated policies on wild animal conservation and community development as 'good'; however, DV residents were significantly more likely than ORV residents to rate wildlife conservation policies as 'good'. Policies on community forestry were the most popular among respondents, with 69% indicating the policies were 'good'. Overall conservation area policies were considered 'good' by only 53% of respondents.

Table 6.9: Attitudes toward conservation area management, ACA (Q#61A, 78A, C-F)

The protected area authorities...	<i>Positive</i>	<i>Negative</i>	<i>Don't Know</i>
...try to solve the problems of local residents through development programs.	71.8%	21.3%	6.9%
...are generally helpful and understand our problems, needs and expectations.	68.1	13.8	18.1
...are open to our suggestions and concerns regarding development and conservation programs.	75.0	8.0	17.0
...treat us as equal partners in development and conservation.	77.7	8.0	14.4
...don't understand our problems and needs.	63.3	19.1	17.6
...encourage us to participate in conservation and development programs.	83.5	7.4	9.0
Scale mean ^a	8.22		
Standard deviation ^a	2.43		
N ^a	165		
Missing cases ^a	23		

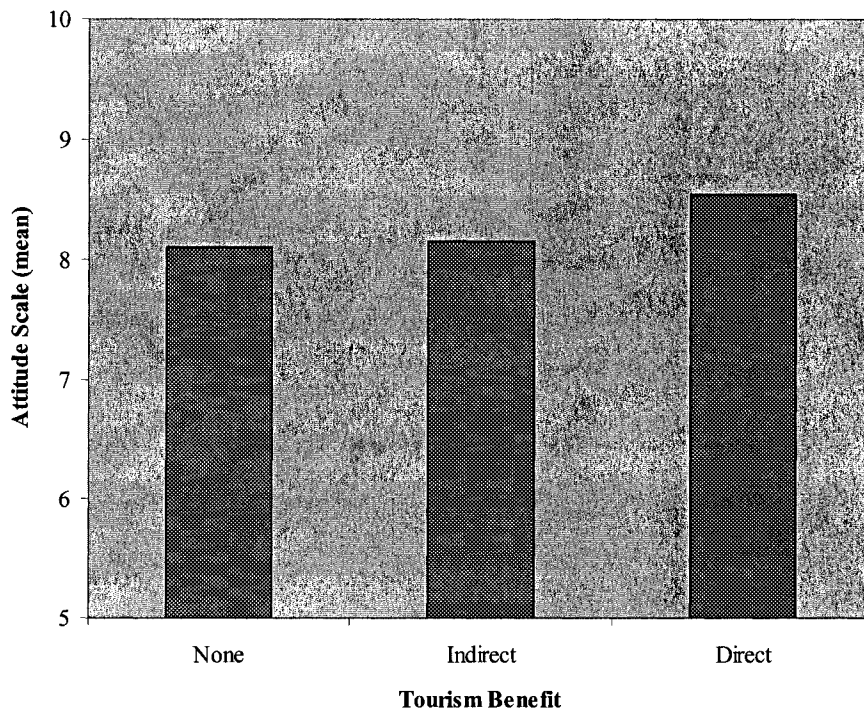
Percentages are based on total number of respondents. Statements were used to create a scale to measure attitudes. ^aSummary of scale details. Respondents were asked to agree or disagree with a statement. For negative worded statements, disagree corresponded with a positive response. Respondents were assigned a score of 1 for positive responses and 0 for negative responses. Based on a 1 - 10 scale, a high mean score indicates a positive attitude.

Table 6.10: Perceptions of conservation area policies, ACA (Q#41, 42, 43, 44)

How would you rate the conservation area's policy...	<i>Good</i>	<i>Okay</i>	<i>Bad</i>	<i>Don't Know</i>
... on wild animals conservation? ^a	55.9%	37.8%	5.3%	1.1%
<i>DV</i>	68.0	31.1	1.0	0.0
<i>ORV</i>	41.2	45.9	10.6	2.4
... on community development?	58.0	35.1	2.7	4.3
... on community forestry?	69.1	26.6	2.7	1.6
... overall? ^b	52.7	40.9	1.6	4.8
N	188			

Differences within sample significant at the < 0.0001 level. ^aChi-square tests reveal significant differences between villages ($\chi^2 = 17.791$, $V = 0.301$, $p < 0.0001$). No other significant differences by village. ^bTwo cases missing.

Figure 6.3: *Attitude by tourism benefit, ACA (Q#3, 61A, 76G, I, 78A, C-F)*



Results of Kruskal-Wallis show differences are non-significant ($\chi^2 = 0.542$, $df = 2$, $p < 0.8$). Results are not separated by village category as the relationship of interest is how benefits from tourism influence attitudes, not how inequities in the distribution of tourism benefits throughout the region affect attitudes. Inequities in benefit distribution are discussed in Chapter 5.

6.3.2 Linkage

The levels of benefit perceived in ACA were compared with scores on the linkage scale to determine if IBPs establish a direct link between local livelihoods and conservation. In the literature tourism is considered well positioned to establish strong linkages between livelihoods and resource conservation (Groom et al. 1999; Hamilton et al. 2000). Linkage scores were also compared between direct and indirect recipients of tourism benefits. The average score on the linkage scale in ACA was 4.6 out of 10, with 10 representing a high score. A logistic regression analysis was employed to examine the relationship between perceptions of benefit and linkage (Table 6.11). Overall perceptions of benefit and receipt of tourism benefits were found to have significant

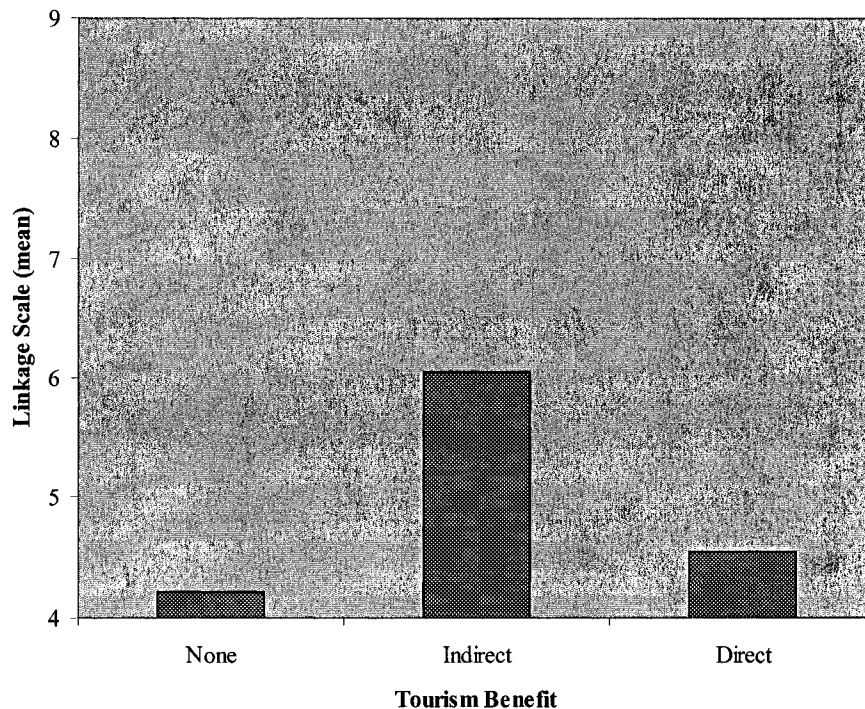
Table 6.11: Results of logistic regression between respondent's perception of benefit receipt and perception of linkage between livelihood and conservation area, ACA (Q#3, 61B, D, E, H, K, 76G, I, 77)

Benefits	B	SE	Wald	p	Odds Ratio*
Perception of benefit receipt	-0.31	0.08	14.71	0.000	0.73
Direct Tourism Benefit	0.49	0.40	1.53	0.216	1.64
Indirect Tourism Benefit	1.79	0.51	12.24	0.000	6.01
Nagelkerke R Square	0.22				
N	162				
Missing cases	26				

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 70.4%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

effects on an individual's perception of linkage. However, the relationship between overall benefit and linkage was negative. For each one point decrease on the ten-point benefit receipt scale, the odds increase by 1.4 that the respondent will perceive a high link between their livelihood and conservation. The variables created to test type of tourism benefit indicate an odds ratio of 6.0 for respondents indirectly benefiting, when all other variables are equal. No relationship exists between direct tourism benefits and linkage perceptions. The bar graph displayed in Figure 6.4 provides a visual interpretation of this relationship between tourism benefit and linkage. Residents indicating indirect benefits from tourism have the highest mean score on the linkage scale, while residents benefiting directly from tourism, or not benefiting at all, have lower mean scores.

Figure 6.4: Perception of linkage by tourism benefit, ACA (Q#3, 61B, D, E, H, K, 76G, I, 77)



Results of Kruskal-Wallis show differences are significant ($\chi^2 = 14.908$, $df = 2$, $p < 0.001$). Results are not separated by village category as the relationship of interest is how benefits from tourism influence linkage perceptions, not how inequities in the distribution of tourism benefits throughout the region affect linkage perceptions. Inequities in benefit distribution are discussed in Chapter 5.

6.3.3 Attitudes, Linkage and Benefits

The relationship scale created facilitates logistic regression analysis to measure associations between attitudes toward conservation area management, receipt of benefits, and linkage with local livelihoods. First, bivariate simple logistic regression was used to determine the effect of household benefit receipt on attitudes. The analysis revealed a significant positive association between benefits and attitudes, with attitudes toward conservation area management improving as benefits increased (Table 6.12).

Hierarchical logistic regression was used to explore the relationship between attitudes, benefits and linkage (Table 6.12). With the effect of linkage controlled, the association between benefits and attitude remained significant, yet no association was found between

linkage scores and attitude. Therefore, a respondent's perception of the link between his / her livelihood and conservation has no effect on attitudes toward conservation area management.

Table 6.12: Results of hierarchical logistic regression between attitudes and perception of benefit receipt and perception of linkage, ACA (Q#61B, D, E, H, K, 63A, 66A, 77, 78A, C-F)

Blocks	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>Odds Ratio*</i>	<i>Nagelkerke R Square</i>
Block One						
Perception of benefit receipt	0.36	0.09	16.53	0.000	1.43	0.169
Block Two						
Perception of benefit receipt	0.33	0.09	13.04	0.000	1.39	
Perception of linkage	-0.12	0.08	2.23	0.135	0.88	0.187
N	144					
Missing cases	44					

B = regression coefficient, SE = standard error, Wald = Wald statistic, p = significance. Overall fit of predicted to observed results = 66.0%. *When B is negative, odds ratio needs to be inverted to indicate odds. Equation to invert ratio (1 / odds ratio).

6.3.4 Discussion

Although perceptions of benefit receipt lead residents in ACA to hold positive attitudes toward the conservation area management, a link between natural resources and livelihoods is not recognized. ACAP's ability to distribute tourism revenues throughout the protected area has rendered attitudes independent of an individual's participation in tourism. However, despite the ability of benefits to yield positive attitudes, the ability of IBPs in ACA to continue to foster conservation support in the future is questionable without clear direct linkages between benefits and livelihoods.

Although extensive support for forest conservation was indicated in the results, the majority of residents believe local people should still be able to use forest resources. These results concur with findings in RCNP and other studies (Fiallo and Jacobson 1995;

Ite 1996; Bauer 2003), suggesting local people in developing countries see no incompatibility between exploitation and resource protection, and "often fail to understand why resources should be protected if they are never going to be exploited" (Hill 1996: 182). Wildlife conservation was less popular than forest conservation especially within ORVs. ORVs suffer more than DVs from damage to crops caused by wild animals, yet, overall, support for wildlife conservation remained high. Although the results suggest the majority of respondents support wildlife conservation, additional comments offered during most interviews indicate residents only support the conservation of species not responsible for crop or livestock damage: "We have to protect the nice animals but should be allowed to kill other harmful animals like bear and porcupine." These results suggest people perceive forest and wildlife conservation favourably provided conservation does not threaten subsistence activities (Bauer 2003).

While not all respondents recognize the need for a conservation area, residents do consider the creation of ACA to have improved their community. Residents not only support the conservation area but are pleased to be included in its boundaries. Benefits and forest protection are the most common reasons cited in support of ACA's existence. The results show respondents perceive ACA to have a limited impact on tourism, supporting the weak linkage identified between tourism benefits and conservation.

While residents in Mustang acknowledge the need to conserve natural resources and support the conservation role of ACA, attitudes toward conservation area management and policies are less favourable. Individual response statements used in the attitude scale suggest a third of respondents do not believe the conservation area authorities are concerned over the needs and problems of local people. Although not all residents

perceive that ACAP strives to incorporate local people in the management of the conservation area, the majority of respondents feel their participation is valued. Respondents are most in favour of ACAP policies on community forestry. Before the establishment of ACA, many respondents indicate substantial resource shortages in the region. Respondents' comments suggest ACA has been influential in promoting community forestry and encouraging sustainable resource management:

ACAP stopped the careless deforestation of the jungle. People need to buy a permit to cut trees, and thus there is no chance of being careless. Had ACAP not come here, the whole jungle which we have now would have disappeared already.

However, despite the support indicated for forest conservation, many residents indicate distaste toward restrictions on the collection of herbs and mushrooms. At the time of this research, ACAP was in the process of initiating measures for the commercial extraction of some herbs with local participation based on preliminary studies of suitability for extraction. Such efforts will likely improve local attitudes toward ACA forest policies. Overall, respondents are least satisfied with policies on wildlife conservation, especially within ORVs, due to restrictions on destroying wild animals responsible for crop damage and preying on livestock.

The results suggest IBPs in ACA are not perceived to be directly linked to conservation objectives. The receipt of benefits does not lead to a perceived link between livelihoods and forest and wildlife conservation in general. To the contrary, the fewer benefits a respondent receives, the more likely a link between livelihood and conservation will be recognized. This result may be due to the alternatives provided by benefits to traditional resource dependent livelihoods. Although resource dependency does not vary with perceived levels of benefit (Chapter 5), respondents receiving benefits

may still recognize the availability of alternatives should resources be damaged in the future, and simply choose to continue to extract resources due to convenience and affordability. As a result, benefiting respondents perceive no connection between their livelihood and the state of natural resources. On the other hand, those receiving few benefits have limited alternatives for livelihood substitution should resources be depleted, and, therefore, depend on resources in the conservation area.

The type of benefit received from tourism is associated with a respondent's perception of a link between conservation and livelihoods. Those directly benefiting from tourism have lower linkage scores than individuals indirectly benefiting from tourism. This result conflicts with findings in past studies (Walpole and Goodwin 2001; Gadd 2005) and implies that direct tourism benefits do not create a perceived link with conservation objectives. While these results appear to contradict the intention of applications of tourism as an IBP, it is important to note that the history and appeal of tourism in the ACA region can explain these results, and, in fact, the higher linkage perceived by those indirectly benefiting from tourism indicates ACAP has been able to extend tourism benefits to those previously not able to benefit from tourism in the region. The lower link perceived by those directly benefiting from tourism may be due to the existence of the tourism industry prior to the establishment of ACA, so perhaps those involved directly in tourism do not see tourism as a benefit resulting from ACAP's efforts to protect wildlife and other resources (Mehta and Heinen 2001). In addition, the endangered wildlife in ACA are elusive and therefore not a significant tourist attraction (Krüger 2005). Geology and geography are the main attractions in ACA, not the wildlife, and therefore wild animals, and the integrity of the habitat upon which they depend, are

not necessarily linked to local livelihoods through tourism. Given the absence of a wildlife-based tourism market, direct employment in tourism in ACA does not cause residents to consider conservation activities as integral to their livelihood.

On the other hand, as noted above, those indirectly benefiting from tourism recognize a link more than direct beneficiaries of tourism benefits. This result may be explained by the success of tourism benefit extension efforts by ACAP. Prior to the establishment of ACA, residents not directly involved in tourism would have received few benefits. The revenue collected from tourist entry fees is now spread throughout the conservation area. Respondents indicating the receipt of indirect tourism benefits recognize these benefits are a result of the establishment of the conservation area, as illustrated by this comment made by a respondent in an ORV:

We had no income from the forest in the past, but now the forest provides some income since ACAP came and that money is being invested to build temples, trails, and toilets.

Higher perceptions of benefit receipt in communities within ACA correspond with positive attitudes toward management. However, given that benefits are received regardless of tourism involvement (Chapter 5), attitudes do not fluctuate based on whether a respondent perceives direct, indirect or no tourism benefits. Relationships between benefits and positive attitudes have been confirmed in many studies (Fiallo and Jacobson 1995; de Boer and Baquete 1998; Hamilton et al. 2000; Abbot et al. 2001; Archabald and Naughton-Treves 2001; Jim and Xu 2002; Sekhar 2003; Stem et al. 2003; McClanahan et al. 2005); however, for benefits to lead to continual conservation support, local residents must perceive benefits to be directly dependent on biodiversity (Bauer 2003). The results indicate the recognition of a direct link between conservation and

local livelihoods does not lead to higher levels of support for the conservation area. This result is counterintuitive and implies a respondent's perception of the link between their livelihood and conservation has no effect on attitudes toward ACA. Similar results were found in a study conducted in 39 IBPs around the world (Salafsky et al. 2001). Benefits with an indirect link to conservation were found to foster the most community support. Although such findings suggest establishing a direct link between livelihoods and conservation is not essential for IBPs to influence attitudes, the positive attitudes found by Salafsky et al. (2001) and in ACA are likely to fluctuate depending on the lifecycle stage of the project (Kiss 2004).

While higher levels of benefit are resulting in positive attitudes toward ACA, benefits may not contribute to long term support for conservation. Currently IBPs in ACA are based on indirect linkages where benefits are offered in return for restrictions on resource use, but do not create self-sustaining incentives for protection (Salafsky and Wollenberg 2000). Actually, the benefits seem to be having the opposite affect. If benefits alter traditional ways of life, the alternative livelihoods may have less connection or need for conservation (Barrett and Arcese 1995). Currently the IBPs run in ACA appear to residents more like a development project solving local livelihood problems by issuing hand-outs than a conservation project creating recognized direct linkages between livelihood improvements and conservation. The perception held by local residents of ACAP as a development agency is indicated by respondents' comments holding ACAP responsible for solving all their problems and demanding more development activities:

To make [the conservation area] more effective we need to ... eradicate poverty, and make health care and education available and accessible to everybody. In addition, we must introduce technology to tap local resources and open factories and industries to provide employment opportunities to people.

This comment is typical of respondents' expectations that ACAP should fulfill local development needs, which also typically exclude concern over ACAP's conservation role. Barrett and Arcese (1995) classify this concept as a *moral hazard problem*, where the provision of compensation through benefits to protect people from a loss of access to resources or damage caused by wildlife leads people to behave in a manner maximizing benefit receipt. Without establishing a direct linkage with local livelihoods, support for conservation will remain contingent on the ability of ACA to continually provide sufficient measurable benefits to local residents (Brandon and Wells 1992; Kiss 2004). The literature abounds with examples of failures of IBPs to alter extractive behaviour without establishing clear direct linkages between resource conservation and local livelihoods or benefits extended through the program. Based on twenty-three case studies, Brandon and Wells (1992) provide an example of the implications of benefits indirectly linked to conservation. The IBP involved a large agricultural project initiated to curb deforestation. Although the project was successful, logging continued largely due to the lack of an "explicit link in the minds of local people between growing more and better rice and making more money by logging" (Brandon and Wells 1992: 563). Benefits not linked to local livelihoods simply constitute buying local support, and may lead local residents to hold conservation hostage in return for increased benefits (Barrett and Arcese 1995; Struhsaker 2002).

All IBPs risk becoming redundant when local people are presented opportunities for greater economic advancement (Hackel 1998). At the time of this research, road construction work had been completed through the entire Lower Mustang District in ACA. While roads can elevate the social and economic conditions for rural livelihoods,

their ecological implications challenge conservation objectives and hamper the ability of IBPs to deliver sufficient benefits amidst increasing demands of growing populations (Schelhas and Shaw 1995; Brandon 1998a; Dobson et al. 1999; Gautam et al. 2004a). However, even negligible benefits distributed through IBPs have been able to curb large development projects in the past (Archabald and Naughton-Treves 2001; Zimmerman et al. 2001). In Bwindi Impenetrable National Park, Uganda, benefits were directly linked to conservation, and, therefore, local residents rejected a road construction proposal out of concern for the direct impact the road would have on household tourism earnings (Archabald and Naughton-Treves 2001). In contrast, based on survey results from this research, residents in ACA show overwhelming support for road construction (96%), even though 46% of respondents recognize the road will have negative effects on conservation. The lack of local opposition to the road can be attributed to the fact that residents, for the most part, do not perceive current benefits to be dependent on conservation. Also current levels of benefit do not exceed the perceived potential opportunities provided by a road, as suggested by this comment from a DV resident during an interview: “The benefits from the road will far outweigh that from tourism. It will easily compensate the losses”. When benefits are not directly linked to livelihoods, IBPs cannot compete with the dominating economic forces driving local decisions to maximize personal benefits (Brandon 2002).

The lack of perceived linkage by respondents in ACA does not currently limit the ability of benefits to improve attitudes, and benefit distribution has been able to generate favourable attitudes even among those not directly involved in tourism. Despite the successful impact IBPs have had on local attitudes, the inability of IBPs to generate

opposition to large-scale development projects with severe potential environmental implications provides an indication that IBPs are not achieving the desired effect in gaining genuine local commitment to the future conservation of natural resources in the area. The ability of IBPs to continually act as incentives in the future is questionable given the lack of a perceived dependency between livelihoods and conservation efforts.

6.4 Linking Livelihoods and Conservation – A Comparison Between RCNP and ACA

A comparison between linkage and attitude scores for respondents from RCNP and ACA provides an indication of the connection between livelihoods and conservation created by IBPs and how attitudes are influenced by linkage perceptions and benefit receipt. Although the majority of local people in both areas held favourable attitudes toward protected area management, attitudes are significantly more positive in ACA than in RCNP (Table 6.13). DVs and ORVs in ACA also have significantly more favourable attitudes toward protected area management than in RCNP. These differences can partially be explained by differences in the overall management approach. The philosophy behind ACA as a biosphere approach to conservation includes active involvement of local people at the community level in the management of conservation and development activities. While the implementation of ACA was initiated by an external agency, and therefore is not a truly community-based initiative, the ultimate goal of ACAP is to build local capacity and commitment so that management in the future will be handed over to local people. RCNP, on the other hand, adopts an exclusionary core zone approach to park management, precluding the availability of park resources for community use. Essentially, boundary residents are seen as external to the park, and efforts to extend benefits are intended to encourage adherence to park restrictions.

Table 6.13: Perceptions of linkage and attitude comparison between RCNP and ACA (Q#61B, D, E, H, K, 78)

	<i>z</i>	<i>p</i>	<i>Relationship</i>
<i>Between protected areas</i>			
Linkage	-8.12	0.000	RCNP > ACA
Attitude	-4.30	0.000	ACA > RCNP
<i>Destination Villages</i>			
Linkage	-8.20	0.010	RCNP > ACA
Attitude	-2.89	0.004	ACA > RCNP
<i>Off-Route Villages</i>			
Linkage	-3.92	0.000	RCNP > ACA
Attitude	-2.89	0.003	ACA > RCNP

Results of Mann-Whitney U tests.

Under the exclusionary core zone approach, the needs of local people are seen as secondary to the conservation of natural resources, and therefore, it is expected that RCNP residents would hold less favourable attitudes than ACA residents. Also, RCNP residents suffer more from crop loss (see Table 5.20) and have more difficulties meeting livelihood needs ($\chi^2 = 43.228$, $p < 0.0001$, $V = 0.344$) than residents in ACA. While neither protected area provides adequate direct compensation for wildlife damages, with the combination of livelihood difficulties and prevalent crop damage in RCNP, it is not surprising that RCNP residents hold less positive attitudes than residents in ACA.

On the other hand, residents in RCNP recognize livelihoods are directly linked to conservation significantly more than ACA residents (Table 6.13). Linkage scores are also significantly higher in DVs and ORVs in RCNP. These differences can partly be attributed to the dependency of tourism in RCNP on wildlife, which is not the case in ACA. The results of the logistic regression analyses (see Table 6.5 and 6.11) revealed perceptions of linkage increase as levels of perceived benefit increase for RCNP residents, but not for ACA residents. Again, this result is not surprising given the differences in the type of tourism attractions in the regions. The results also indicate

linkage perceptions in RCNP increase as tourism involvement becomes more direct.

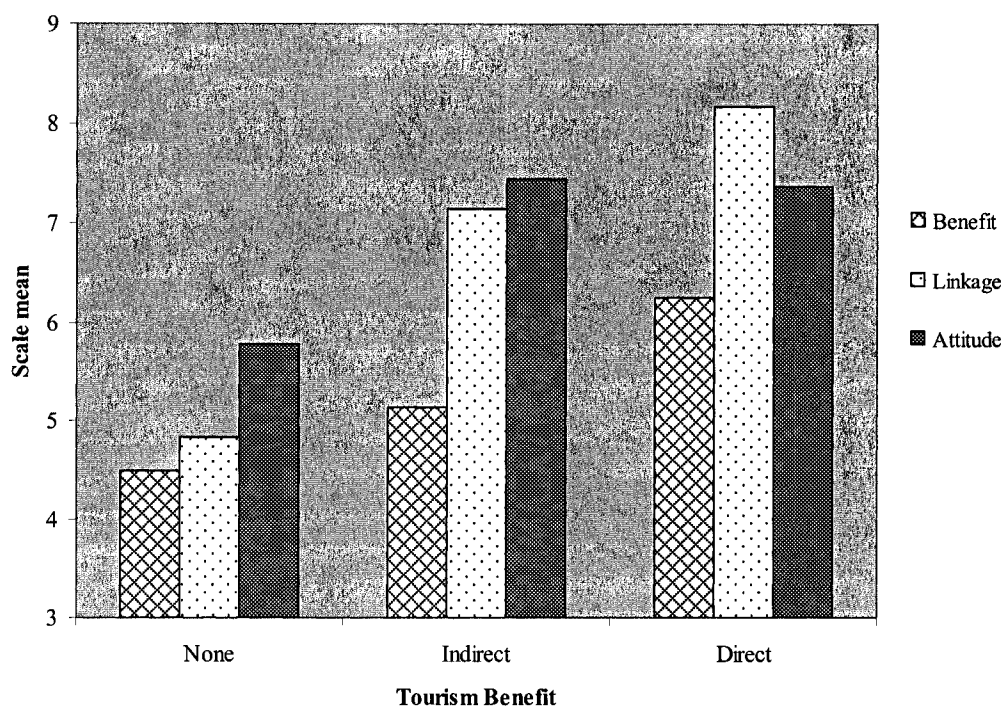
Tourism was not found to have a similar impact in ACA; only those indirectly benefiting from tourism recognized a link. These results may seem surprising, but may be explained by the presence of a tourism market in ACA prior to the establishment of the protected area.

In both protected areas, a positive attitude corresponds with higher perceptions of benefits (see Table 6.6 and 6.12). However, in RCNP, attitudes are not determined by benefits so much as by an individual's perception of a link between benefits and personal livelihood. In ACA, linkage has no influence on attitudes; respondents' attitudes are based solely on the receipt of benefits. Tourism benefit influences attitudes in RCNP, but not ACA. In RCNP, attitudes improve as tourism benefit becomes more direct, while in ACA attitudes remain constant despite benefits from tourism. These results may be partially explained by differences in benefit distribution between the two protected areas (Chapter 5). These associations between benefit receipt, linkage, and attitudes based on tourism benefit are visually reflected in the bar graphs in Figures 6.5 (RCNP) and 6.6 (ACA).

6.5 Conclusion

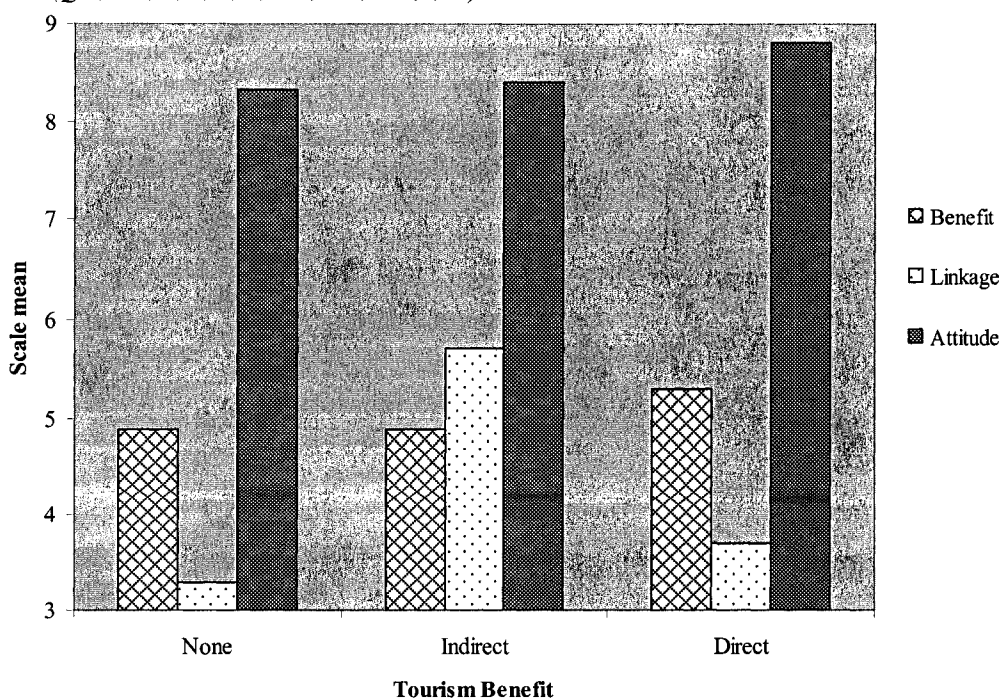
In order for IBPs to make meaningful contributions to conservation objectives, benefits must generate positive attitudes toward conservation among residents living within or around protected areas (Groom et al. 1999). Although case studies throughout the world provide examples of the positive changes in local attitudes resulting from IBPs (de Boer and Baquete 1998; Gillingham and Lee 1999; Abbot et al. 2001; Goodwin and

Figure 6.5: Perceptions of benefits, perceptions of linkage, and attitude by tourism benefit, RCNP (Q#3, 61B, D, E, H, K, 63A, 66A, 76G, I, 78)



Results of Kruskal-Wallis show a significant relationship between tourism benefits and: perceptions of benefits ($\chi^2 = 24.568$, $p < 0.0001$), perceptions of linkage ($\chi^2 = 53.209$, $p < 0.0001$) and attitude ($\chi^2 = 10.340$, $p < 0.006$).

Figure 6.6: Perceptions of benefit, perceptions of linkage, and attitude by tourism benefit, ACA (Q#3, 61B, D, E, H, K, 63A, 66A, 76G, I, 78)



Results of Kruskal-Wallis show relationships with tourism benefits are non-significant for perceptions of benefits ($\chi^2 = 1.513$, $p = 0.5$) and attitude ($\chi^2 = 2.371$, $p = 0.3$) and significant for perceptions of linkage ($\chi^2 = 13.603$, $p < 0.001$).

Roe 2001; Mehta and Heinen 2001; Bauer 2003; Sekhar 2003), IBPs cannot provide sufficient incentives over the long term without linking benefits and livelihoods directly to the state of natural resources (Alpert 1996; Salafsky and Wollenberg 2000; Brown 2002).

This chapter examined local perceptions of linkage, and how perceptions of benefits and linkage influence attitudes in communities surrounding RCNP and within ACA. An examination of attitudes included separate comparisons between attitudes toward resource conservation, the protected area in general, and the current management authority. Individual questions concerning livelihood dependency on natural resources were combined to form a scale measuring linkage. A respondent's recognition of benefits was then compared with linkage scores to determine whether IBPs in the corresponding protected areas establish a direct connection between benefits and livelihoods. An attitude scale, created from individual response statements regarding attitudes toward management, was compared with perceptions of benefits and linkage to determine if IBPs led to positive attitudes and if the recognition of a direct link to natural resources made attitudes more favourable. The research has shown that IBPs based on direct linkages to natural resources can generate positive attitudes. However, when benefits derive primarily from tourism, as is the case in both protected areas in this study, unless the tourism attraction is based directly on natural resources, a linkage will not be recognized. While benefits can still lead to positive attitudes without clear linkages to conservation, the IBP may lose persuasion when alternative options – conflicting with

conservation objectives – arise promising to provide greater economic benefit. Extractive practices may continue even when direct linkages can be established, unless benefits address the needs and costs borne by local residents.

Chapter 7: Creating Incentives in Incentive-based Programs

7.1 Summary of Results

The aim of this research was to answer the following question: *are social and economic benefits extended by protected area approaches in Nepal able to create incentives for conservation?* While the results do not allow for the declaration of one approach as more successful than another, the findings clearly highlight some strengths and weaknesses in core / buffer zone and biosphere reserve approaches as indicated by *perceptions* of benefits, linkage and attitudes.

Table 7.1 provides an overall summary of the findings from Chapters 5 and 6. In RCNP, the overall perception of benefit receipt is high, but households in ORVs that are not directly participating in tourism perceive the least benefit. Overall, the perception of linkage is high, but also increases as benefits increase. Attitudes improve based on an increased perception of a dependency between benefits, livelihoods and conservation. In ACA, although the perceived benefits in DVs are lower than in RCNP, benefits are equal regardless of tourism participation or village location. However, households suffering more from crop loss and facing difficulties meeting livelihood needs receive less benefits than those not experiencing crop loss and the wealthy. Generally benefits are not perceived to be linked to conservation, except by those indirectly benefiting from tourism. Attitudes are not influenced by linkage perceptions but by benefits. Despite lower perceptions of benefits and linkage, attitudes in ACA are more positive than in RCNP.

Although the two protected areas examined in this research are considered in the literature to be leading examples of innovative IBPs, these findings indicate that neither

Table 7.1: Summary of variables influencing perceptions of benefits, costs, linkage and attitudes for within and between protected areas.

			RCNP		ACA	
			DV	ORV	DV	ORV
Benefits by type ^a	Household		Economic; and social development benefits	Extraction benefits	No difference	No difference
	Community		Economic; social; development; and conservation benefits	Extraction benefits	No difference in other benefits identified	Participation benefits
	Tourism		More benefit overall; Direct tourism benefits	Indirect tourism benefits	More benefit overall; Direct tourism benefits	Recognition of indirect benefits not different from DV
Costs by type	Crop loss	Within ^b	Lower occurrence	Higher occurrence	Lower occurrence	Higher occurrence
		Between ^c	Higher occurrence overall, in DV, and in ORV		Lower occurrence	
	<i>Influencing variables^d</i>		<i>Village category</i>		<i>Village category, origin, occupation, caste</i>	
	Livestock depredation	Within ^b	No difference	No difference	Lower occurrence	Higher occurrence
		Between ^c	Lower occurrence		Higher occurrence overall, and in ORV	
	<i>Influencing variables^d</i>		<i>Gender, age</i>		<i>Wealth, occupation</i>	
	Resource dependency	Within ^b	Lower dependency	Higher dependency	Lower dependency	Higher dependency
		Between ^c	Lower dependency		Higher dependency overall, in DV, and in ORV	
<i>Influencing variables^d</i>		<i>Village category, age, caste</i>		<i>None</i>		
Perception of benefit receipt	Within ^b	Perceive more benefits	Perceive less benefits	No difference	No difference	
	Between ^c	Higher in DV only		Lower in DV only		
<i>Influencing variables^d</i>		<i>Village category, tourism benefit, low crop loss</i>		<i>Wealth, low crop loss</i>		

Continued

Table 7.1: Continued

	RCNP	ACA
	DV ORV	DV ORV
Perception of linkage ^c	Higher overall, in DV, and in ORV	Lower overall, in DV, and in ORV
<i>Influencing variables^d</i>	<i>Increases as perception of benefit increases; increases as tourism benefit becomes more direct (direct tourism benefit most likely to lead to perception of direct linkage, followed by indirect tourism benefit)</i>	<i>Increases as perception of benefit decreases; higher among indirect tourism beneficiaries</i>
Attitude ^c	Lower overall, in DV, and in ORV	Higher overall, in DV, and in ORV
<i>Influencing variables^d</i>	<i>Increases as perception of benefit increases due to perception of direct link; increases with tourism benefit</i>	<i>Increases as perception of benefit increases; not related to linkage perceptions or tourism benefit</i>

^aOnly significant differences are shown and listed under the village category recognizing the specific benefit more. ^bDifferences between villages within protected areas. ^cDifferences between protected areas. ^dInfluencing variables are presented for the entire protected area.

RCNP nor ACA have been able to overcome the common barriers faced by IBPs in generating incentives for conservation. While the benefits extended in RCNP are highly linked to conservation, as long as inequities in benefit distribution remain, IBPs will not result in positive attitudes among the disadvantaged. Similarly, while attitudes in ACA are fairly positive among those receiving benefits, distribution remains unfair and not equal. In addition, without clearly defined links between livelihoods and the state of natural resources, the ability of IBPs to encourage environmental stewardship is questionable over the long term.

The results in both protected areas indicate IBPs have not created adequate incentives to entirely prevent activities counterproductive to conservation. In RCNP, reports of continued poaching and observations of increased extraction when enforcement personnel were otherwise occupied were rampant. In ACA, while results indicate the occurrence of illegal extraction, the widespread support for road construction indicates IBPs do not provide sufficient incentive to curb such large-scale development.

7.2 Limitations of Incentive-based Conservation

Despite notable achievements in both RCNP and ACA in delivering benefits that establish a connection between livelihoods and conservation, the results suggest IBPs remain unable to create enough incentive to generate lasting support for conservation. Potential limitations to the ability of IBPs to generate long term conservation support include: insufficient benefits, inability to address needs and costs, unrealistic expectations, and the area's tourist appeal.

7.2.1 Level of Benefit

In a review of IBP case studies with tourism as the primary benefit, Krüger (2005) found the revenue generated by tourism was insufficient to prevent consumptive land and resource use in failed projects. A similar explanation could explain the inability of IBPs to alter behaviour in RCNP and ACA. In both areas, tourism revenue is lost to external businesses and operators (Wells 1994; Brown et al. 1997; Bookbinder et al. 1998). In addition, the current national political situation has led to a decline in tourist arrivals in the country. These two circumstances reduce the amount of benefits available at the local level. Given the large human populations surrounding RCNP and within ACA, providing sufficient incentive to alter the resource use decisions of the individual is difficult. When IBPs are further confounded by a deflated funding source, the ability to provide sufficient revenue to a large population is unlikely.

7.2.2 Daily Needs and Costs

For IBPs to make meaningful contributions to conservation, benefits extended by the program must address or alter the livelihood needs of local residents (Tisdell 1999). While the results show local residents in RCNP and ACA do receive benefits from IBPs, for the most part, the livelihood implications resulting from conservation remain unaddressed. While alternative energy sources are promoted in both protected areas, local people remain dependent on natural resources for subsistence. So long as people continue to require resources to meet livelihood needs, no type of communal development benefit will suffice to alter extraction. Similarly, unless the losses from protected wildlife are directly offset by IBPs, people will continue to face personal hardships, and support for conservation is doubtful.

7.2.3 Local Expectations

Failures in IBPs are partially caused by unmet local expectations of benefits (Barrett and Arcese 1995; Ite 1996; McIvor 1997; Songorwa 1999; Abbot et al. 2001; Ferraro 2001; Goodwin and Roe 2001; Loon and Polakow 2001). With the advent of incentive-based conservation, protected areas are being held responsible for solving large-scale, social and economic problems beyond their original intentions, scope and capabilities (Muller-Böker and Kollmair 2000; Brandon 2002). Results in ACA indicate local people have such high expectations and demands of IBPs. So long as expectations exceed the benefits provided by IBPs in ACA, residents will not be satisfied with the benefits received, and they will continue to pursue alternatives that meet their needs for social and economic development regardless of compatibility with conservation objectives.

7.2.4 Tourist Appeal

While tourism can link livelihoods with conservation objectives, such linkage typically requires wildlife to be the attraction motivating tourist arrivals (Honey 1999; Newmark and Hough 2000; Adams and Infield 2003; Gadd 2005; Krüger 2005). In RCNP, tourism depends on the opportunity to view endangered wildlife; hence, benefits from IBPs are highly linked to conservation. In contrast, although ACA is the most popular destination in Nepal, tourists visit due to the high mountain scenery and hiking opportunities. The wild animals in ACA are elusive, and therefore, it is difficult to establish a linkage among livelihoods, benefits and conservation perceived by local people. Without a link, the benefits extended by IBPs are not likely to create strong enough incentives for conservation in the long term.

7.3 Recommendations for Further Research

The research presented in this thesis represents only a portion of the information gathered during field research. While this research provides a valuable examination of IBPs in RCNP and ACA in terms of the distribution of benefits, the link between benefits, livelihoods and conservation, and the influence of benefits and linkage on attitudes, the additional data collected provides further opportunities for future detailed analysis. An examination is needed of how the benefits provided by IBPs compare with the needs identified by local residents. While Appendix 5.1 provides a breakdown of community needs identified in each protected area, the information warrants further in-depth analysis exploring the appropriateness of IBPs relative to the needs identified by local people. Also, attitudes need to be considered relative to participation in conservation and development committees. The literature suggests participation is fundamental in the ability of IBPs to generate positive attitudes toward conservation (Fiallo and Jacobson 1995; Gillingham and Lee 1999; Abbot et al. 2001; Archabald and Naughton-Treves 2001; Mehta and Heinen 2001; Sah and Heinen 2001). RCNP and ACA differ significantly in their integration of local people in management; an in-depth analysis of participation between and within approaches would further the understanding of the achievements and challenges of IBPs in Nepal.

In addition to the future research opportunities provided by the existing data set, the results also indicate the need for further research on IBPs beyond the information collected. An issue raised during the field research was the impact of a road on the traditional livelihoods of local people and the conservation of natural resources in ACA. The road will result in drastic changes to the social, economic, political and ecological

composition of the region, and will likely change the dynamics of tourism by making ACA less aesthetic for some and more accessible for others. These changes will require adaptive management approaches by ACAP in the application of IBPs. While environmental impact assessments are the responsibility of the district government, no assessment has been conducted for this development. ACAP will need to fully understand the implications of managing a protected area fragmented by a road; however, during the research, ACAP representatives provided no indication of considering the road's impact in future management plans. A detailed study is needed on the impacts the road will have on current IBPs, and how IBPs will need to adapt to address the changes.

The literature suggests outsiders can have a significant impact on the success or failure of IBPs (Barrett and Arcese 1995; Brandon 1998b; Walpole and Goodwin 2001; Sekhar 2003). The research presented here does not specifically address this issue; however, outsiders not only receive benefits from IBPs in RCNP and ACA but also adversely impact biodiversity conservation, and, therefore, need to be considered in an analysis of IBPs.

Human-wildlife conflict proved to be a major barrier inhibiting the success of IBPs in RCNP and ACA. Research has been conducted on the suitability of certain mitigation methods in other areas (de Boer and Baquete 1998; O'Connell-Rodwell et al. 2000; Karanth and Madhusudan 2002); however, the failure to control wildlife threats and the corresponding negative effects on attitude, warrant testing to identify appropriate mitigation measures specific to each protected area. The future success of IBPs greatly depends on the ability of conservation authorities to address the negative livelihood consequences resulting from conservation.

During the field research, the impact of the current political situation on biodiversity conservation became apparent. A detailed examination of how the political conflict is affecting conservation efforts in Nepal could provide valuable information on the rising threats to biodiversity in the country.

While this research does not allow for direct comparisons between the core / buffer zone and biosphere reserve approaches, it highlighted key considerations for future research into applications of incentive-based conservation strategies. For an equal comparison between core zone and biosphere reserve approaches, protected areas offering similar tourist attractions must be studied. Finally, as the success of IBPs depends on the combination of unique social, economic, political and ecological conditions of a given area, a comparison of the same measures for benefit distribution, linkage and attitudes as used in this study would provide interesting information on the relationships between these variables in other regions.

7.4 Suggestions for Improving Incentive-based Programs in RCNP and ACA

The results show IBPs have fallen short of expectations of contributions to biodiversity conservation in RCNP and ACA. Although some suggest such failures to be insurmountable and inherent in the incentive-based approach (Noss et al. 1999; Soulé and Terborgh 1999; Terborgh 2000), learning from mistakes and strengthening IBPs remain justified. IBPs currently hold the most promise as a means to integrate the needs of local people and conservation, and present the best alternative to improve existing conservation efforts and extend conservation beyond the traditional boundaries of exclusionary core zones. The success of IBPs depends on the unique, *site-specific* combination of social,

economic, political and ecological characteristics. Suggestions for improving the IBPs in RCNP and ACA surfaced from the research conducted and are discussed below.

7.4.1 Education

Education is essential to ensuring local residents recognize the link between conservation, benefits and livelihoods (Krüger 2005). While education is a major component of IBPs in ACA, ACAP needs to ensure awareness campaigns highlight the connection between resource conservation and benefits extended by the program. Since tourism in ACA is not necessarily dependent on conservation, achieving such linkage recognition is most likely in regions not benefiting directly from tourism.

7.4.2 Enforcement

The social and ecological circumstances surrounding RCNP suggest IBPs will never preclude the need for effective enforcement mechanisms. The human population residing in the buffer zone is comprised largely of immigrants from the mountains and middle hills, thereby creating a diverse social mosaic. Such social foundations lead to uncertainties stemming from a disconnected human population, and when combined with the lack of ownership over park land and resources typical of the core zone approach, over-exploitation of the commons is likely (Ostrom 1990; Dolšak and Ostrom 2003). In addition, the wildlife protected by the park cause substantial damage to local livelihoods and hold high value in the illegal international market for endangered animal parts. Under such conditions, the absence of effective enforcement is likely to threaten the biodiversity contained in the park.

7.4.3 Cost Mitigation and Compensation

Conflicts between wildlife and humans result in substantial consequences for livelihoods and conservation in developing countries throughout the world (Shyamsundar and Kramer 1996; Colchester 1997; Tisdell 1999; Karanth and Madhusudan 2002). The results presented in this research show crop loss and livestock depredation are experienced by a significant portion of residents in RCNP and ACA, and neither protected area has successfully addressed these problems. The research shows current mitigation measures are insufficient to protect residents from damages, and compensation schemes (in place only in RCNP) are insufficient and overly burdensome to claim. If local people are expected to protect wild animals despite damages to their livelihood, then their losses must be mitigated or compensated. The promotion and support of mitigation methods to prevent wildlife conflict should become a priority for IBPs. In the interim, until successful mitigation measures are established, direct compensation payments need to be considered. The results suggest that efforts in both protected areas to address wildlife conflict would make positive contributions to local attitudes toward conservation.

7.4.4 Regulate Tourism

Tourism is often criticized as an IBP due to the disproportionate benefits received at the local level, and the corresponding loss of income potential to outsiders (Brown et al. 1997; Koch 1997; Honey 1999; Tisdell 1999; Walpole and Goodwin 2000; Goodwin and Roe 2001; Loon and Polakow 2001; Hutton and Leader-Williams 2003; Sekhar 2003). In order for IBPs to provide sufficient benefits to alter extractive behaviour, the retention of tourism revenue by the local communities needs to be maximized. The regulation of the

tourism industry in ACA has prevented the devaluation of the market and enabled the local population to maximize their income from tourism. In contrast, the tourism industry in the buffer zone surrounding RCNP has no formal mechanisms to avoid losses of revenue potential from the devaluation of products and services through competitive pricing. Using the existing committees established in the buffer zone, tourism needs to be regulated to prevent the unhealthy price competition currently common among hotel operators. Also, in both protected areas, IBPs need to further encourage partnerships between *local* producers of goods and tourism service providers in order to integrate the local economy with the tourism industry and minimize the loss of revenue potential at the local level. This integration will also provide benefits on a more personal level rather than the communal benefits typically extended by IBPs, and personal benefits will be better positioned to compensate individual victims of wildlife damages. Finally, IBPs need to maximize local participation directly in tourism by supporting and promoting local employment opportunities for tourist guides and porters. In RCNP, all tourist groups are required to be accompanied by two certified local guides when entering the park. While I do not suggest ACA restrict self-guided tourist parties, they can support local employment as tourist guides and porters through training opportunities and residency requirements for guiding permits. For example, many of the guiding companies operating in ACA are based in the capital city, Kathmandu, and many of the guides working for these companies are not from the ACA region. As a requirement for operating permits, ACAP could impose requirements for a certain percentage of an organization's guides and porters to be from the ACA region. Supporting local participation in direct employment opportunities would help the local population retain

tourism benefits and would contribute to conservation goals as local guides and porters would have more interest in minimizing the ecological impacts of tourism given ACA is their home. In addition, through training, local people could become interpreters of the natural history and local culture, thereby developing a link between tourism and conservation.

7.5 Conclusions

With 70% of the world's protected areas inhabited by subsistence-based human populations, and many others being threatened by encroachment across their borders, the need to consider social issues and local livelihoods in biodiversity conservation is essential (Terborgh and Peres 2002; Van Schaik and Rijksen 2002). IBPs have been initiated in biosphere reserves and buffer zones in an attempt to create incentives to encourage local support for conservation. Incentive-based conservation has presented the most promise as a means to conserve the world's resources while meeting the needs of local people. Since their inception, IBPs have received much criticism by conservationists, and rightfully so given the limitations in their ability to achieve both conservation and development goals (Brandon 2002). Many of the criticisms centre on deficiencies in the distribution of benefits and the lack of a recognized connection between conservation and IBPs (Bookbinder et al. 1998; Brandon 1998b; Walpole and Goodwin 2000; Goodwin and Roe 2001; Davenport et al. 2002; Gadd 2005).

Perceptions of benefit distribution, linkage and their corresponding effects on attitudes were discussed in relation to IBPs in RCNP and ACA. The research found that benefits continue to be unfairly and unequally distributed, and the exclusion of individuals from IBP benefits results in less favourable attitudes toward conservation

management. In RCNP, the perception of a link between conservation and livelihoods contributed to favourable attitudes; however, linkages did not contribute to attitudes in ACA as IBPs do not successfully establish a link. Based on accounts and observations of ongoing illegal extraction and widespread support for environmentally destructive development, the results suggest IBPs are not having the desired effect in gaining long term local support for conservation.

RCNP and ACA are endorsed as exemplary models of IBPs, and although the results indicate barriers to the successful implementations of the approach, both protected areas have made notable achievements. Although the research does not allow for declarations of one protected area model as more appropriate for the application of IBPs than another, the results do indicate the success of the core / buffer zone approach or the biosphere approach depends on the unique characteristics of the region and the customization of IBPs to suit the area's social and ecological needs. This study specifically highlights the limitations and successes of IBPs in core / buffer zones and biosphere reserves in Nepal, but the relevance of the findings to other areas can be inferred given the results are consistent with other similar studies around the world (Fiallo and Jacobson 1995; de Boer and Baquete 1998; Gillingham and Lee 1999; Songorwa 1999; Archabald and Naughton-Treves 2001; Walpole and Goodwin 2001; Jim and Xu 2002; Bauer 2003; Stem et al. 2003).

Evaluations of IBPs are essential to continually improve the approach; however, IBPs are not a panacea for all conflicts between humans and conservation and are not necessarily appropriate in all areas where humans and conservation conflict. Protecting biodiversity around the world depends on ongoing development of, evaluation of, and

improvement in the methods available to conservationists and local people. The success of any given project, including IBPs, depends on the particular context of the specific region.

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Appendices

Appendix 3.1: Protected areas of Nepal

Appendix 3.1: Protected areas of Nepal

	Protected Area	IUCN Category	Gazetted	Area in sq. km	Ecoregion	Elevation Range (metres)	Management
<u>National Parks</u>							
<i>An area set aside for the conservation, management and utilization of flora, fauna and scenery along with the natural environment</i>	Royal Chitwan National Park	II	1973	932	Terai	150-815	DNPWC
	Langtang National Park	II	1976	1710	Middle hills, mountains	792-7245	DNPWC
	Rara National Park	II	1976	106	Mountains	1800-4048	DNPWC
	Sagarmatha National Park	II	1976	1148	Mountains	2800-8850	DNPWC
	Shey-Phoksundo National Park	II	1984	3555	Mountains	2000-6885	DNPWC
	Khaptad National Park	II	1984	225	Middle hills	1000-3276	DNPWC
	Royal Bardia National Park	II	1984	968	Terai	152-1494	DNPWC
	Makalu-Barun National Park	II	1991	1500	Middle hills, mountains	435-8463	DNPWC / MI
	Shivapuri National Park	II	2002	144	Middle hills	1366-2732	DNPWC
Total Area				10288			
Area percentage of protected area network				37.1%			
<u>Wildlife Reserves</u>							
<i>An area set aside for the conservation and management of wildlife resources and their habitats</i>	Royal Suklaphanta Wildlife Reserve	IV	1976	305	Terai	90-270	DNPWC
	Koshi Tappu Wildlife Reserve	IV	1976	175	Terai	90.000	DNPWC
	Parsa Wildlife Reserve	IV	1984	499	Terai	150-815	DNPWC
Total Area				979			
Area percentage of protected area network				3.5%			
<u>Hunting Reserve</u>							
<i>An area set aside for the management of wildlife for hunting</i>	Dhorpatan Hunting Reserve	VI	1987	1325	Mountains	2850-7000	DNPWC
Total Area				1325			
Area percentage of protected area network				4.8%			

Continued

Appendix 3.1: Continued

Appendix 5.1: Continued

	Protected Area	IUCN Category	Gazetted	Area in sq. km	Ecoregion	Elevation Range (metres)	Management
<u>Conservation Area</u>							
<i>An area to be managed according to an integrated plan for the conservation of natural environment and balanced utilization of natural resources</i>	Annapurna Conservation Area	VI	1992	7629	Middle hills, mountains	450-8092	KMTNC
	Kanchanjunga Conservation Area	VI	1997	2035	Middle hills, mountains	1200-8598	DNPWC / WWF-Nepal
	Manaslu Conservation Area	Other	1998	1663	Middle hills, mountains	1360-8163	KMTNC
Total Area - Category VI and Other (excluding bufferzones)				12652			
Area percentage of protected area network				45.7%			
<u>Buffer Zones</u>							
<i>A peripheral area of a national park or reserve prescribed in order to facilitate the use of forest resources on a regular and beneficial basis for the local people</i>	Royal Chitwan National Park	VI	1996	767	Terai		DNPWC / Communities
	Royal Bardia National Park	VI	1996	328	Terai		DNPWC / Communities
	Langtang National Park	Other	1998	420	Middle hills, mountains		DNPWC / Communities
	Shey-Phoksundo National Park	Other	1998	449	Mountains		DNPWC / Communities
	Makalu-Barun National Park	Other	1999	830	Mountains		DNPWC / Communities / MI
	Sagarmatha National Park	Other	2002	275	Mountains		DNPWC / Communities
	Royal Suklaphanta Wildlife Reserve	Other	2004	243.5	Terai		DNPWC / Communities
	Koshi Tappu Wildlife Reserve	Other	2004	173	Terai		DNPWC / Communities
	Parsa Wildlife Reserve	Other	2005	298	Terai		DNPWC / Communities
Total Area				3783.7			
Area percentage of protected area network				13.7%			
Total Area of Protected Area Network				27702.7			
Percentage of Nepal Land Area				18.82%			

Source: HMGN 1973; KMTNC 1997; Nepal 2002; DNPWC 2004; WDPA 2005

Appendix 4.1: Villages included in the study in RCNP and ACA

Protected Area	DV	ORV
RCNP	Odhara ^a Sauraha	Beltandi Janakpur Manohara Naya Parsa
ACA	Jharkot Kagbeni Kalopani Kinga Lete Marpha Ranipawa Tukuche	Chhairo Chhayo Chhongur Chimang Dhumba Jhipra Deurali Kunjo Lubra Naurikot Parsyang Polche Sauru Taglung Tiri Gaur Titi

The villages in ACA are small; therefore, many villages were included in the study as compared to RCNP.

^aThis village is a continuation of Sauraha.

Appendix 4.2: Questionnaire survey

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APPROACHES TO BIODIVERSITY CONSERVATION IN NEPAL



1. Who are the members of your household, and what are their ages and sex?

Members	Age					Sex		Education Q#2					Occupation Q#3	Park Related Q#4	
	C	Y	A	M	S	M	F	P	LS	S	U	Z		Y	N
Respondent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
2. Spouse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

Note: C = under 18, Y = 18 – 24, A = 25 – 45, M = 46 – 64, S = 65+, M = Male, F = Female, P = Primary, LS = Lower Secondary, S = Secondary, U = University, Z = No education, Y = Yes, N = No

2. What is each household member's level of education?

Refer to chart above

3. What is each household member's occupation (*use student for children attending school*)?

Refer to chart above

4. Are any members of the household directly employed by the protected area?

Refer to chart above

5. What is your caste? _____

6. What is your religion? _____

7. Is this your birth place, or did you move here from elsewhere?

☐ Birth place *proceed to question #10*

☐ Moved from _____

8. Why did you move here?

Reasons	Most Important	Somewhat important	Not important	Don't know
Employment opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agricultural opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Political reasons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Religious reasons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Natural calamities in previous village	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To be close to family / friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To be close to nature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

check all that apply and rank

9. How long have you lived here? _____ Years

This section contains questions about your household's socio-economic status

10. What is the size of your landholding?

_____ Bigha _____ Kattha _____ Ropani _____ Anna

11. Do you grow crops?

_____ Yes _____ No
if no, proceed to question #19

12. What crops do you grow?

Crops	Wild animals responsible for damage Q#14

13. Have any wild animals ever damaged your crops?

_____ Yes _____ No
if no, proceed to question #19

14. Which crops have been damaged by which wild animals?

Refer to chart above

15. Why do you think these wild animals damage your crops?

Reasons	Most important	Somewhat important	Not important	Don't know
They do not have enough food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They like agricultural crops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Over population of wild animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Authorities do not control the wild animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

check all that apply and rank

16. What was your total loss of income due to crop raids by wild animals last year?

_____ rupees

17. Has the protected area authority compensated you in cash or kinds?

_____ Yes _____ No

if no, proceed to question #19

18. What was the amount? What was the kind?
 _____ rupees _____ kind

19. Do you keep livestock?
 _____ Yes _____ No
if no, proceed to question #28

20. What livestock do you keep?

Livestock	Number of Livestock Q#21	Wild animals responsible for predation Q#23	Number killed Q#24

21. For each type of livestock you keep, what is the quantity?
Refer to chart above

22. Have any wild animals ever killed your livestock?
 _____ Yes _____ No
if no, proceed to question #29

23. Which livestock have been killed by which wild animals?
Refer to chart above

24. How many of your livestock have been killed by wild animals during the last year?
Refer to chart above

25. Why do you think these wild animals kill your livestock?

Reasons	Most important	Somewhat important	Not important	Don't know
They do not have enough food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They like domesticated livestock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Over population of wild animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Authorities do not control the wild animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

check all that apply and rank

26. What was your total loss of income due to wild animals killing livestock last year?

_____ rupees

27. Has the protected area authority compensated you in cash or kinds?

_____ Yes _____ No

if no, proceed to question #29

28. What was the amount? What was the kind?

_____ rupees _____ kind

29. What is your approximate annual income?

_____ rupees

30. Are you able to support your food and clothing needs with your current annual income?

Yes	Sometimes	No	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Mehta and Heinen (2001)

This section contains questions regarding your attitudes towards conservation and your perceptions of institutions and their policies

31. Are you aware of the existence of the protected area?

_____ Yes _____ No

32. Do you see any need for the protected area to exist?

Ite (1996)

33. What organizations or agencies are involved with the protected area? Or Who runs this protected area?

- ☐ Government
- ☐ Government and NGO
- ☐ NGO
- ☐ Foreign NGO
- ☐ Other organization
- ☐ Don't know

34. Why do you think this protected area was created?

Reasons	Most Important	Somewhat important	Not important	Don't know
Protect wild animals for the future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protect the forest for the future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stop poaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protect the cultural heritage of the area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allow for community development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promote tourism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Repair fallow lands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To improve the living standards of the community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To generate tourism income for outsiders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In response to pressure from the international community to create protected areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

check all that apply and rank

35. Do you agree or disagree with the following statements about the protected area?

Statements	Agree	Disagree	Don't know
It is important to protect the plant species in the protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is important to protect the wild animal species in the protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is a waste of time and money to conserve forests and wildlife.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People should be able to hunt in the protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People should be able to collect plants or trees from the protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People who poach should be punished.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is a good thing that this land is protected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Gillingham and Lee (1999)

36. Did you live here when the protected area was created, or do you remember the creation of this protected area?

_____ Yes _____ No

if no, proceed to question #39

37. Thinking about your perceptions at the time the protected area was established, do you agree or disagree with the following statements about the protected area?

Statements	Agree	Disagree	Don't know
I thought the protected area was created for the betterment of our community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was happy that my village was included / bordered the protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generally speaking, I initially liked the new protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Mehta and Heinen (2001)

38. Please explain why you were initially happy or unhappy with the protected area?

39. Based on your current experiences, do you agree or disagree with the following statements about the protected area?

Statements	Agree	Disagree	Don't know
The protected area was created for the betterment of our community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am generally satisfied that my village is included / borders the protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generally speaking, I like the protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Mehta and Heinen (2001)

40. Please explain why you currently like or dislike the protected area?

41. How would you rate the protected area's policy on wild animal conservation?

Good	Okay	Bad	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

42. How would you rate the protected area's policy on community development?

Good	Okay	Bad	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

43. How would you rate the protected area's policy on community forestry?

Good	Okay	Bad	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

44. Overall, how would you evaluate the management of the protected area? Or how it is being taken care of?

Good	Okay	Bad	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

45. Please explain why you feel that way about the protected area's policies on wildlife, forest, community development, community forests, and the overall management of the protected area.

46. Who do you like to work with most in development and conservation activities?

Pick one

- ☐ Local or national non-government organizations
- ☐ Foreign non-government organizations
- ☐ Government representatives
- ☐ Others Specify: _____
- ☐ Don't know

47. Thinking about who you would like to work with most, do you agree or disagree with these statements?

Statements	Agree	Disagree	Don't know
I like their overall policies on community development and conservation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They are friendly, approachable, and understand our problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They provide benefits other organizations cannot provide.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They respect our culture and value our role in conservation and development.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

48. In your opinion, which group or a combination of groups from the following table would be the best to manage this protected area?

Check only one box

	Government	Non-government organization	Foreign non-government organization	Local communities	Other: Specify
Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-government organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foreign non-government organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

49. Please explain why you think the group or these groups is / are the most appropriate to manage the protected area.

50. Has the protected area negatively affected you, or has it created any problem for you?

_____ Yes _____ No

51. What are the main problems you face because of the protected area?

Problem	Major problem	Sometimes a problem	Not a problem	Don't know
Damages caused by wild animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confrontations with protected area authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Threats to human safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restrictions on access to resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restrictions on livestock grazing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inability to meet subsistence needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decline in cultural values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loss of economic opportunities from the sale of natural resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased costs of living	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

check all that apply and rank

52. How much do you think your economic status has changed due to the establishment of the protected area?

Much Improvement	Somewhat improved	No change	Somewhat worse	Much worse	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

53. How does your economic status today compare to five years ago?

Much Improvement	Somewhat improved	No change	Somewhat worse	Much worse	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

54. How frequently do you obtain these resources from within the protected area?

Reasons	Frequently	Sometimes	Never	Don't know
Wood /firewood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Live trees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plants and herbs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild animals – meat and fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land for livestock grazing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

55. Would you like to have more access to resources within the protected area?

_____ Yes _____ No

if no, proceed to question #58

56. Which resources would you like to have more access to in the protected area?

Reasons	Most Important	Somewhat important	Not important	Don't know
Dead trees and wood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Live trees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plants and herbs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild animals – meat and fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land for livestock grazing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

57. What important need of your household would be met if the protected area provides you better access to its resources?

- ☐ Construction material
- ☐ Food
- ☐ Areas for livestock grazing
- ☐ Medicines
- ☐ Economic opportunities from the commercial sale of resources
- ☐ Opportunities for spiritual / traditional activities
- ☐ Firewood
- ☐ Other - Specify: _____
- ☐ Don't know

58. How have the protected area's policies impacted your subsistence and economic opportunities?

Prompts: Policies such as....
Restrictions on resource use
Protection of wild animals
Encouragement of local participation

59. How have the protected area's conservation and development activities affected the tradition and culture of your community?

- ☐ Improved
- ☐ Worsened
- ☐ No difference
- ☐ Don't know

60. How have the protected area's conservation and development activities affected your community's traditional knowledge of the forest?

- ☐ Improved
- ☐ Worsened
- ☐ No difference
- ☐ Don't know

This section contains questions regarding the program benefits from conservation

61. Do you agree or disagree with the following statements about benefits?

Statements	Agree	Disagree	Don't know
Protected area authorities try to solve the problems of local residents through development programs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The protected area provides employment to many local people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The protection of the forest and wild animals is essential to the area's future tourism potential.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My livelihood depends on the existence of the forest and wild animals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The protection of the forest and wild animals does not improve the social services in my community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is good that this protected area is protected for our future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourists would still visit this area if there was less forest and wild animals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The protection of the forest and wild animals does not improve my standard of living.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACA authorities care more about wild animals than local people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvements to the social services available in my community are due to the presence of the protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourists come here because of the protected area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The authorities protect the protected area so that the resources will be available for use in the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Nepal and Weber (1993)

62. Who do you think **should** benefit most from the protected area?

Group	Should benefit most	Should benefit somewhat	Should benefit least	Should not benefit	Don't know
You and your household	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surrounding communities – Who:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immigrants: Other Nepali	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Resident foreigners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-government conservation organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nepal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

63. Of the groups listed below, how much do you think they **actually do** benefit from the **protection** of forests and wild animals?

Group	Benefit most	Benefit somewhat	Benefit least	No benefit	Don't know	Describe benefits Q#64
You and your household	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Your community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Surrounding communities – Who:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Immigrants: Other Nepali	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Resident foreigners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Non-government conservation organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Nepal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
International community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

64. What do you think are the benefits for each group you identified?

Refer to chart above

65. Why do you think some of the groups you just mentioned benefit more than others?

66. Of the groups listed below, how much do you think they **actually do** benefit from the **development programs** run by the protected area?

Group	Benefit most	Benefit somewhat	Benefit least	No benefit	Don't know	Describe benefits Q#67
You and your household	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Your community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Surrounding communities – Who:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Immigrants: Other Nepali	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Resident foreigners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Non-government conservation organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Nepal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
International community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

67. What do you think are the benefits for each group you identified?
Refer to chart above

68. Why do you think some of the groups you just mentioned benefit more than others?

69. What do you think are the needs of your community? Can you provide examples of these needs?

	Needs	Most Important		Somewhat important		Not important		Don't know	
		R Q#70	A Q#71	R Q#70	A Q#71	R Q#70	A Q#71	R Q#70	A Q#71
Economic development		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social programs		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forest Protection		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild animal protection		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cultural protection		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: R = respondent, A = authority

70. How would you rank the importance of these needs to you?

Refer to chart above

71. In regard to the needs you have identified, what do you think are the priorities of the protected area authority?

Refer to chart above

72. Have the conservation projects been successful at meeting any of the needs that you have identified?

Yes	Somewhat	No	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

73. What projects have been implemented by the protected area?

*Prompts: Project such as....
Safe drinking water
Training programs
Electricity projects*

Projects	Q#74			
	Significant difference	Some difference	No difference	Don't know
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

74. Have these programs made any difference in terms of improving your standard of living?

Refer to chart above

75. How would you rate the protected area authority's ability to deliver benefits to you personally?

Excellent	Good	Poor	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

76. Do you agree or disagree with the following statements about tourism?

Statements	Agree	Disagree	Don't know
I would be happy to see more tourists here.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourism makes goods and services more expensive.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because visitors like to experience our culture, tourism strengthens our cultural traditions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Only outsiders benefit financially from tourism to our area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our community has too many tourists.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourists do not respect our local culture and traditions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My family has more money because of tourism.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The financial opportunities offered to me by tourism have adequately offset my losses from conservation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourism benefits my family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourism is damaging our culture.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Walpole and Goodwin (2001)

77. If the resources of the protected area were to be damaged, what would happen to your livelihood activity?

- ☐ Continue as is
- ☐ Improve
- ☐ Worsen
- ☐ End
- ☐ Don't know

Salafsky and Wollenberg (2000)

This section contains questions regarding participation in conservation projects

78. Do you agree or disagree with the following statements regarding your relationship with the protected area authority and staff?

Statements	Agree	Disagree	Don't know
They are generally helpful and understand our problems, needs and expectations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They are not interested in our needs or concerns.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They are open to our suggestions and concerns regarding development and conservation programs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They treat us as equal partners in development and conservation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They don't understand our problems and needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They encourage us to participate in conservation and development programs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
They don't respect our input or appreciate our efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

79. Are you a member, or do you participate in any development or conservation committees or groups?

_____ Yes _____ No

if no, proceed to question #85

Prompts:

Wildlife conservation groups

Wildlife patrolling groups

Water distribution groups

Community forestry user groups

Education groups

Community infrastructure development groups

Alternative energy groups

Mother's groups

80. List all the committees and user groups in which you are a member.

Groups	Leadership Q#81	Q#82		
		Month / year	Days / month	Hours / day
	<input type="checkbox"/>			
	<input type="checkbox"/>			
	<input type="checkbox"/>			
	<input type="checkbox"/>			
	<input type="checkbox"/>			
	<input type="checkbox"/>			
	<input type="checkbox"/>			

81. Do you have a leadership role in any of these groups?

Refer to chart above

82. How frequently do you participate in these programs?

Refer to chart above

83. Has your participation in development and conservation been beneficial for your family?

_____ Yes _____ No

84. Please explain why participation has or has not been beneficial to your family.

85. If you had more free time, would you be able to volunteer for community development or would you need to work to make more money to support your family?

_____ Volunteer _____ Work

86. Are there any barriers limiting your participation in development and conservation initiatives?

_____ Yes _____ No

if no and already a participant, proceed to question #89

87. What are the barriers or what prevents you from participating? (check all that apply)

Barriers	Most significant	Somewhat significant	Not significant	Don't know
Demands from household chores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schedule conflicts with agricultural activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schedule conflicts with livestock grazing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schedule conflicts with other employment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conflicts with other livelihood activities: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demands of family childcare responsibilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protected area policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The meeting place is too far from my home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nobody invited to participate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was not welcomed by others when I participated in the past	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I did not know I could participate as well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not know how to become involved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have no free time to participate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nobody listens to me, so why should I participate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am not interested in participating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

check all that apply and rank

88. What would make you participate more often?

89. Are you happy with the process committee and user group leaders are selected?

_____ Yes _____ No

if yes, proceed to question #92

90. Why are you unhappy with the way committee and user group leaders are selected?

91. What do you think needs to be changed to improve the selection procedures?

92. Did the committees and / or user groups you were involved with set any goals for last year?

_____ Yes _____ No

if no, proceed to question #95

93. What were the goals for the committees and / or user groups.

Goals	Q#94			
	Most effective	Somewhat effective	Not effective	Don't Know
Committee / User Group / Program: _____				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Committee / User Group / Program: _____				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Committee / User Group / Program: _____				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

94. How effective have committees and user groups been in meeting their goals?

Refer to chart above

95. What do you think should change to improve the programs offered by the protected area? Do you have any suggestions?

96. Is there anything that we have missed or that you would like to comment on?

Thank you very much for your participation!

ACA - Additional Questions (Road)

Insert in the end of Benefit Section (Q#77)

A1. Are you happy that a road to Pokhara is being built?

Yes	Somewhat	No	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

A2. What impact do you think the completion of the road to Pokhara will have on your way of life?

Much improvement	Somewhat improvement	No change	Somewhat worse	Much worse	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

A3. What impact do you think the completion of the road to Pokhara will have on the protection of the forest and wild animals?

More protection	No change	Much less protection	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

A4. What do you think will be the positive impacts of the road on your way of life, your community and the conservation of the forest and wild animals?

A5. What do you think will be the negative impacts?

Appendix 4.3: Questionnaire summary of frequency distributions for demographic section

#	Variable	Profile of respondents		Profile of household	
		Royal Chitwan National Park	Annapurna Conservation Area	RCNP	ACA
1	<i>Age in years</i>				
	under 18	0.0%	0.0%	37.9%	36.0%
	18 - 24	16.4	11.7	15.1	14.5
	25 - 45	57.1	47.9	29.9	26.5
	46 - 64	22.8	33.5	13.7	17.6
	65 +	3.7	6.9	3.5	5.4
	<i>Sex</i>				
	Male	49.7%	47.9%	52.2%	49.5%
	Female	50.3	52.1	47.8	50.5
2	<i>Education</i>				
	None	36.5%	34.6%	31.5%	28.1%
	Primary	15.9	28.2	21.6	31.8
	Lower Secondary	14.4	12.8	17.9	18.5
	Secondary	19.7	18.6	16.3	16.6
	University	13.8	5.9	12.7	5.0
3	<i>Occupation</i>				
	Housework	20.6%	11.2%	18.0%	11.3%
	Agriculture	47.1	45.7	20.7	26.5
	Tourism	24.9	26.6	8.8	8.7
	Other	5.8	16.5	10.4	15.3
	Student	1.6	0.0	33.5	31.3
	None	0.0	0.0	0.1	0.9
	N/A (Infant)	0.0	0.0	8.8	6.1
4	Occupation related to protected area? (% yes)	0.5%	0.5%		

Continued

Appendix 4.3: Continued

#	Variable	Profile of respondents							
		Royal Chitwan National Park				Annapurna Conservation Area			
5	<i>Caste</i>								
	Low caste / untouchable	12.2%				22.3%			
	Traders	53.4				68.1			
	Brahman / Chhetri	34.4				9.6			
6	<i>Religion</i>								
	Hindu	84.7%				27.1%			
	Buddhist	5.8				63.3			
	Other	9.5				9.6			
7	<i>Origin</i>								
	Native	61.9%				84.0%			
	Migrant	38.1				16.0			
8	<i>Why did you move here? (% of immigrants)</i>	Most important	Somewhat important	Not important	Don't know	Most important	Somewhat important	Not important	Don't know
	Employment opportunities	21.5%	20.1%	57.6%	0.7%	46.6%	3.4%	50.0%	0.0%
	Agricultural opportunities	40.3	13.2	46.5	0.0	5.4	3.6	91.1	0.0
	Economic opportunities	23.6	14.6	61.8	0.0	16.1	7.1	76.8	0.0
	Political reasons	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0
	Religious Reasons	0.7	2.8	96.5	0.0	1.8	1.8	96.4	0.0
	Natural calamities in previous village	10.4	9.0	80.6	0.0	7.1	1.8	91.1	0.0
	To be close to family / friends	21.5	20.1	57.6	0.7	23.2	25.0	51.8	0.0
	To be close to nature	11.9	11.2	76.9	0.0	10.7	21.4	67.9	0.0
	Other	38.2	0.7	0.0	0.0	17.9	1.8	0.0	0.0
9	<i>Average number of years of residence for immigrants</i>	17.8				13.1			

Appendix 4.4: Questionnaire summary of frequency distributions for household socio-economic status section

#	Variable	Royal Chitwan National Park	Annapurna Conservation Area
10	Average size of landholding in hectares	0.51	0.16
11	Households growing crops	85.2%	90.4%
12	Crops (% of farmers)		
	Apple	0.0%	45.9%
	Apricot	0.0	1.2
	Banana	0.6	0.0
	Barley	0.0	67.1
	Beans	1.2	18.2
	Buckwheat	0.0	86.5
	Flax	0.6	0.0
	Lentil	42.9	0.6
	Maize	78.3	77.1
	Millet	1.9	0.0
	Mustard	72.7	0.0
	Peach	0.0	1.2
	Potato	16.1	78.2
	Pulse	0.6	0.0
	Quinoa	0.0	0.6
	Rice	89.4	0.0
	Soybeans	0.6	0.6
	Tree	0.6	0.0
	Uwa	0.0	30.0
	Vegetable	19.3	23.5
	Walnut	0.0	0.6
	Wheat	19.9	24.1
13	Experience crop damage (% of farmers)	90.1%	64.7%

Continued

Appendix 4.4: Continued

#	Variable	Royal Chitwan National Park				Annapurna Conservation Area			
14	<i>Wild animals damaging crops (% of farmers)</i>								
	Bear	0.6%				34.7%			
	Bird	0.6				22.9			
	Boar	57.1				0.0			
	Deer	0.6				10.6			
	Elephant	26.1				0.0			
	Fox	0.0				0.6			
	Ghoral	0.0				3.5			
	Goat	0.0				0.6			
	Jackal	0.0				26.5			
	Leopard	0.6				5.9			
	Marten	0.0				5.9			
	Monkey	0.0				22.9			
	Peacock	0.6				0.0			
	Porcupine	0.0				32.9			
	Rhino	90.1				0.0			
	Rodent	0.0				2.4			
	Sheep	0.0				1.2			
	None	9.9				35.3			
15	<i>Why wild animals damage crops? (% of those experiencing crop loss)</i>	Most important	Somewhat important	Not important	Don't know	Most important	Somewhat important	Not important	Don't know
	They do not have enough food	62.1%	22.8%	14.5%	0.7%	50.5%	34.9%	9.2%	5.5%
	They like agricultural crops	80.0	15.9	1.4	2.8	64.2	18.3	11.9	5.5
	Over population of wild animals	33.1	42.8	21.4	2.8	40.7	40.7	11.1	7.4
	Authorities do not control the wild animals	40.7	40.0	17.2	2.1	29.6	39.8	22.2	8.3
	Other	32.4	2.1	0.0	0.7	17.6	5.6	0.9	0.0
16	Average loss of income from crop loss (Rs)	6599				4779			

Continued

Appendix 4.4: Continued

#	Variable	<i>Royal Chitwan National Park</i>	<i>Annapurna Conservation Area</i>
17	Receive compensation (% yes)	0.7%	0.0%
18	Compensation amount (Rs)	75	0
19	Households keeping livestock	75.1%	85.1%
20	<i>Livestock (% of pastoralists)</i>		
	Cow	24.8%	76.9%
	Ox	5.7	35.0
	Horse	0.0	44.4
	Donkey	0.0	17.5
	Goat	70.2	15.0
	Yak	0.0	3.1
	Duck	16.3	3.8
	Chicken	32.6	54.4
	Buffalo	73.0	3.1
	Pigeon	0.7	1.3
	Bull	1.4	1.9
	Fox	0.0	0.6
	Rabbit	0.0	0.6
	Pig	0.0	0.6
	Jhopa	0.0	22.5
	Sheep	1.4	2.5
	Bee	0.7	0.0
	Elephant	2.1	0.0
21	Average number of livestock	11.9	21.4
22	Experience livestock depredation (% of pastoralists)	45.1%	60.6%

Continued

Appendix 4.4: Continued

#	Variable	Royal Chitwan National Park				Annapurna Conservation Area			
23	Wild animals damaging crops (% of pastoralists)								
	Bear	0.0%				1.3%			
	Bird	0.7				5.0			
	Fox	0.7				0.0			
	Jackal	11.3				33.1			
	Leopard	16.2				43.8			
	Marten	0.0				1.3			
	Mongoose	12.7				0.0			
	Rodent	0.0				1.3			
	Snake	0.7				0.0			
	Tiger	23.2				0.0			
	None	54.9				39.4			
24	Average number of livestock killed	13.4				27.9			
25	Why wild animals kill livestock?	Most important	Somewhat important	Not important	Don't know	Most important	Somewhat important	Not important	Don't know
	They do not have enough food	60.9%	26.6%	10.9%	1.6%	59.6%	23.4%	16.0%	1.1%
	They like domesticated livestock	71.9	18.8	3.1	6.3	56.8	22.1	15.8	5.3
	Over population of wild animals	35.9	42.2	17.2	4.7	50.0	37.2	5.3	7.4
	Authorities do not control the wild animals	48.4	37.5	14.1	0.0	39.4	37.2	18.1	5.3
	Other	21.9	0.0	0.0	0.0	29.8	6.4	2.1	0.0
26	Average loss of income from livestock loss (Rs)	9652				39834			
27	Receive compensation (% yes)	10.9%				0.0%			
28	Compensation amount (Rs)	2200				0			

Continued

Appendix 4.4: Continued

#	Variable	<i>Royal Chitwan National Park</i>	<i>Annapurna Conservation Area</i>
29	Average household income (Rs)	63024	66031
30	<i>Ability to meet livelihood needs</i>		
	No	11.1%	11.7%
	Sometimes	71.4	38.3
	Yes	17.5	50.0

Appendix 4.5: Questionnaire summary of frequency distributions for attitude section

#	Variable	Royal Chitwan National Park				Annapurna Conservation Area			
31	Aware of the existence of the protected area? (% yes)	93.7%				67.6%			
32	"Do you see a need for the protected area to exist?" (% yes)	93.1%				77.1%			
33	<i>Who runs the protected area?</i>								
	Government	45.0%				14.4%			
	Government and NGO	9.0				5.3			
	NGO	2.1				7.4			
	Foreign NGO	10.1				33.5			
	Other organization	13.2				7.4			
	Don't know	20.6				31.9			
34	<i>Why was the protected area created?</i>	Most important	Somewhat important	Not important	Don't know	Most important	Somewhat important	Not important	Don't know
	Protect wild animals for the future	97.4%	1.6%	0.0%	1.1%	80.3%	11.7%	2.1%	5.9%
	Protect the forest for the future	96.8	3.2	0.0	0.0	91.0	3.7	1.6	3.7
	Stop poaching	75.7	20.6	1.6	2.1	52.1	33.5	6.9	7.4
	Protect the cultural heritage of the area	47.1	34.9	10.6	7.4	27.7	41.5	15.4	15.4
	Allow for community development	47.1	34.9	12.7	5.3	32.4	47.9	9.6	10.1
	Promote tourism	70.9	20.6	3.2	5.3	37.8	36.7	6.4	19.1
	Repair fallow lands	39.7	35.4	14.8	10.1	24.5	40.4	20.2	14.9
	To improve the living standards for the community	28.6	46.0	19.0	6.3	16.5	42.0	22.3	19.1
	To generate tourism income for outsiders	22.8	28.6	34.4	14.3	5.3	16.5	47.3	30.9
	In response to pressure from the international community to create protected areas	13.2	13.2	47.1	26.5	4.8	10.1	41.5	43.6
	Other	5.8	0.0	0.0	0.0	6.4	1.6	0.0	0.0

Continued

Appendix 4.5: Continued

#	Variable	Royal Chitwan National Park			Annapurna Conservation Area		
		Agree	Disagree	Don't know	Agree	Disagree	Don't know
35	"Do you agree or disagree with the following statements about the protected area?"						
	It is important to protect the plant species in the protected area.	98.9%	0.5%	0.5%	100.0%	0.0%	0.0%
	It is important to protect the wild animal species in the protected area.	98.4	1.6	0.0	87.8	11.7	0.5
	It is a waste of time and money to conserve forests and wildlife.	20.1	77.8	2.1	6.4	89.9	3.7
	People should be able to hunt in the protected area.	3.7	96.3	0.0	26.2	69.0	4.8
	People should be able to collect plants or trees from the protected area.	46.0	53.4	0.5	58.8	36.4	4.8
	People who poach should be punished.	98.4	1.1	0.5	93.6	3.7	2.7
	It is a good thing that this land is protected.	98.4	1.1	0.5	96.3	2.7	1.1
36	"Did you live here when the protected area was created, or do you remember the creation of this protected area?" (% yes)	18.0%			77.1%		
37	"Thinking about your perceptions at the time the protected area was established, do you agree or disagree with the following statements about the protected area?" (% of respondents present during the creation of the protected area)						
	I thought the protected area was created for the betterment of our community.	64.7%	35.3%		74.3%	11.8%	13.9%
	I was happy that my village was included / bordered the protected area.	64.7	35.3		74.3	10.4	15.3
	Generally speaking, I initially liked the new protected area.	58.8	41.2		74.3	9.7	16.0

Continued

Appendix 4.5: Continued

#	Variable	Royal Chitwan National Park				Annapurna Conservation Area			
38	Please explain why you were initially happy or unhappy with the protected area?	Open-ended question							
39	"Based on your current experiences, do you agree or disagree with the following statements about the protected area?"	Agree	Disagree	Don't know		Agree	Disagree	Don't know	
	The protected area was created for the betterment of our community.	76.7%	17.5%	5.8%		86.7%	6.9%	6.4%	
	I am generally satisfied that my village is included / borders the protected area.	79.4	20.1	0.5		90.4	6.4	3.2	
	Generally speaking, I like the protected area.	93.7	4.2	2.1		96.8	2.7	0.5	
40	"Please explain why you currently like or dislike the protected area?"	Open-ended question							
	"How would you rate the protected area's policy...	Good	Okay	Bad	Don't know	Good	Okay	Bad	Don't know
41	...on wild animal conservation?"	49.2%	42.3%	3.2%	5.3%	55.9%	37.8%	5.3%	1.1%
42	...on community development?"	45.0	43.9	3.7	7.4	58.0	35.1	2.7	4.3
43	...on community forestry?"	54.0	39.7	2.1	4.2	69.1	26.6	2.7	1.6
44	"Overall, how would you evaluate the management of the protected area?"	31.7	54.0	8.5	5.8	52.7	40.9	1.6	4.8
45	"Please explain why you feel that way about the protected area's policies on wildlife, forest, community development, community forests, and the overall management of the protected area."	Open-ended question							

Continued

Appendix 4.5: Continued

#	Variable	Royal Chitwan National Park			Annapurna Conservation Area		
46	<i>"Who do you like to work with most in development and conservation activities?"</i>						
	Local or national NGO	25.4%			9.6%		
	Foreign NGO	19.6			18.1		
	Government representatives	18.0			12.2		
	Others	18.5			28.2		
	Don't know	18.5			31.9		
47	<i>"Thinking about who you would like to work with most, do you agree or disagree with these statements?"</i>						
		Agree	Disagree	Don't know	Agree	Disagree	Don't know
	I like their overall policies on community development and conservation.	88.9%	3.2%	7.9%	91.7%	5.4%	3.0%
	They are friendly, approachable, and understand our problems.	65.1	30.2	4.8	72.6	11.3	16.1
	They provide benefits other organizations cannot provide.	51.3	39.2	9.5	28.0	56.5	15.5
	They respect our culture and value our role in conservation and development.	77.2	16.4	6.3	74.4	8.3	17.3
	Other	0.5	0.5	0.5	17.3	0.0	0.0

Continued

Appendix 4.5: Continued

#	Variable	Royal Chitwan National Park	Annapurna Conservation Area
48	<i>"In your opinion, which group or a combination of groups from the following table would be the best to manage this protected area?"</i>		
	Government	9.0%	13.3%
	NGO	1.1	0.0
	Foreign NGO	2.6	9.0
	Local communities	13.2	8.5
	Others	0.0	1.6
	Government & NGO	5.3	2.1
	Government & foreign NGO	13.8	12.2
	Government & local community	30.2	4.3
	NGO & foreign NGO	0.0	2.7
	NGO & local community	3.2	7.4
	foreign NGO & local community	6.3	13.8
	Local communities & others	0.5	2.1
	Government, foreign NGO & local community	6.3	4.3
	Government, NGO, foreign NGO	0.5	0.0
	Government, NGO, & local community	0.0	3.2
	NGO, foreign NGO, local community	0.5	0.0
	Government, NGO, foreign NGO, local community	3.7	8.0
	Don't know	2.1	7.4
49	"Please explain why you think the group or these groups is / are the most appropriate to manage the protected area."		
	Open-ended question		
50	"Has the protected area negatively affected you, or has it created any problem for you?" (% yes)		
		41.0%	34.2%

Continued

Appendix 4.5: Continued

#	Variable	Royal Chitwan National Park				Annapurna Conservation Area			
		Major problem	Sometimes a problem	Not a problem	Don't know	Major problem	Sometimes a problem	Not a problem	Don't know
51	"What are the main problems you face because of the protected area?"								
	Damages caused by wild animals	58.2%	37.6%	4.2%	0.0%	60.0%	19.3%	20.7%	0.0%
	Confrontations with conservation authorities	3.2	40.2	49.7	6.9	0.7	18.7	78.0	2.7
	Threats to human safety	33.3	54.0	12.2	0.5	7.3	24.7	66.0	2.0
	Restrictions on access to resources	38.6	36.5	24.3	0.5	5.3	18.0	74.7	2.0
	Restrictions on livestock grazing areas	38.6	22.2	38.1	1.1	1.3	7.3	90.0	1.3
	Inability to meet subsistence needs	15.9	23.8	58.2	2.1	7.3	15.3	73.3	4.0
	Decline in cultural values	9.5	21.7	58.2	10.6	10.7	3.3	86.0	0.0
	Loss of economic opportunities from the sale of natural resources	5.8	9.5	59.3	25.4	8.7	6.7	76.0	8.7
	Increased costs of living	37.0	29.6	31.2	2.1	12.0	18.0	61.3	8.7
	Other	0.5	0.0	0.0	0.0	0.7	0.0	0.0	0.0
52	"How much do you think your economic status has changed due to the establishment of the protected area?"								
	Much improvement	5.3%				3.7%			
	Somewhat improvement	12.2				22.5			
	No change	12.7				57.8			
	Somewhat worse	3.2				2.7			
	Much worse	5.8				1.6			
	Don't know	60.8				11.8			
53	"How does your economic status today compare to five years ago? "								
	Much improvement	6.3%				10.6%			
	Somewhat improvement	44.4				38.8			
	No change	24.9				30.9			
	Somewhat worse	19.6				13.3			
	Much worse	4.2				4.8			
	Don't know	0.5				1.6			

Continued

Appendix 4.5: Continued

#	Variable	Royal Chitwan National Park				Annapurna Conservation Area			
		Frequently	Sometimes	Never	Don't know	Frequently	Sometimes	Never	Don't know
54	<i>Frequency of resource extraction</i>								
	Wood / firewood	1.1%	77.8%	21.2%	0.0%	76.6%	20.7%	2.7%	0.0%
	Live trees	0.0	1.1	98.4	0.5	0.5	10.1	89.4	0.0
	Plants and herbs	2.6	9.5	86.8	1.1	1.6	10.6	84.0	3.7
	Wild animals - meat and fish	0.0	23.8	75.7	0.5	0.0	2.1	97.9	0.0
	Land for livestock grazing	5.3	11.1	82.5	1.1	87.8	5.3	4.8	2.1
	Other	3.7	13.8	0.0	0.5	7.4	13.3	0.5	0.0
55	"Would you like to have more access to resources within the protected area?" (% yes)	63.5%				52.7%			
56	<i>Desire for increased access to...</i>	Most important	Somewhat important	Not important	Don't know	Most important	Somewhat important	Not important	Don't know
	Wood / firewood	51.9%	10.1%	1.6%	0.0%	42.0%	5.9%	4.8%	0.0%
	Live trees	19.6	30.2	13.2	0.5	9.1	11.2	31.6	0.5
	Plants and herbs	6.3	24.9	32.3	0.0	9.6	16.0	26.2	0.5
	Wild animals - meat and fish	1.6	3.2	58.7	0.0	1.6	5.9	44.9	0.0
	Land for livestock grazing	9.5	23.8	30.2	0.0	10.7	4.8	36.9	0.0
	Other	16.9	0.5	0.0	0.0	1.6	0.0	0.0	0.0
57	<i>"What important need of your household would be met if the protected area provides you better access to its resources?"</i>								
	Construction material	55.8%				51.5%			
	Food	11.7				7.2			
	Areas for livestock grazing	35.0				19.6			
	Medicines	16.7				32.0			
	Economic opportunities from the commercial sale of resources	8.3				12.4			
	Opportunities for spiritual / traditional activities	6.7				3.1			
	Firewood	87.5				70.1			
	Other	38.3				8.2			
	Don't know	3.3				0.0			

Continued

Appendix 4.5: Continued

#	Variable	Royal Chitwan National Park	Annapurna Conservation Area
58	"How have the protected area's policies impacted your subsistence and economic opportunities?" Open-ended question		
59	<i>"How have the protected area's conservation and development activities affected the tradition and culture of your community?"</i>		
	Improved	61.4%	36.2%
	Worsened	3.7	1.6
	No difference	29.1	50.5
	Don't know	5.8	11.7
60	<i>"How have the protected area's conservation and development activities affected your community's traditional knowledge of the forest?"</i>		
	Improved	91.0%	74.5%
	Worsened	0.5	3.2
	No difference	5.3	18.1
	Don't know	3.2	4.3

Appendix 4.6: Questionnaire summary of frequency distributions for benefit section

#	Variable	Royal Chitwan National Park			Annapurna Conservation Area		
		Agree	Disagree	Don't know	Agree	Disagree	Don't know
61	"Do you agree or disagree with the following statements about benefits?"						
	Protected area authorities try to solve the problems of local residents through development programs.	71.8%	21.3%	6.9%	85.7%	10.6%	3.7%
	The protected area provides employment to many local people.	12.8	76.1	11.2	37.6	59.3	3.2
	The protection of the forest and wild animals is essential to the area's future tourism potential.	86.7	4.8	8.5	97.9	0.5	1.6
	My livelihood depends on the existence of the forest and wild animals.	34.0	59.6	6.4	57.1	39.2	3.7
	The protection of the forest and wild animals does not improve the social services in my community.	35.1	52.1	12.8	23.8	68.3	7.9
	It is good that this protected area is protected for our future.	99.5	0.0	0.5	100.0	0.0	0.0
	Tourists would still visit this area if there was less forest and wild animals.	42.6	50.0	7.4	38.1	59.8	2.1
	The protection of the forest and wild animals does not improve my standard of living.	39.4	46.8	13.8	31.7	63.0	5.3
	Protected area authorities care more about wild animals than local people.	46.30	39.90	13.80	89.90	7.9	2.1

Continued

Appendix 4.6: Continued

#	Variable	Royal Chitwan National Park					Annapurna Conservation Area				
	Improvements to the social services available in my community are due to the presence of the protected area.	69.7%	18.6%	11.7%			82.5%	14.3%	3.2%		
	Tourists come here because of the protected area.	20.7	69.1	10.1			88.9	8.5	2.6		
	The authorities protect the protected area so that the resources will be available for use in the future.	97.8	1.1	1.1			93.1	3.2	3.7		
62	<i>"Who do you think should benefit most from the protected area?"</i>	Should benefit most	Should benefit somewhat	Should benefit least	Should not benefit	Don't know	Should benefit most	Should benefit somewhat	Should benefit least	Should not benefit	Don't know
	You and your household	33.7%	62.0%	2.1%	0.0%	2.1%	19.6%	77.2%	2.6%	0.0%	0.5%
	Your community	89.4	9.0	0.0	0.5	1.1	63.0	36.0	0.5	0.0	0.5
	Surrounding communities	20.3	64.7	4.8	2.7	7.5	25.9	66.1	5.8	0.0	2.1
	Immigrants: Other Nepali	9.1	68.4	11.8	4.3	6.4	9.5	79.4	8.5	1.6	1.1
	Resident foreigners	8.0	61.5	14.4	8.0	8.0	7.4	65.1	16.4	8.5	2.6
	Non-government conservation organizations	16.6	59.4	9.1	4.8	10.2	15.3	64.6	9.5	2.6	7.9
	Nepal	40.6	46.0	2.7	2.1	8.6	69.8	28.6	0.5	0.0	1.1
	International community	12.9	53.8	13.4	7.0	12.9	3.7	37.6	26.5	23.3	9.0
	Other	2.1	1.6	0.0	0.0	0.0	7.4	2.6	0.0	0.0	0.0

Continued

Appendix 4.6: Continued

#	Variable	Royal Chitwan National Park					Annapurna Conservation Area				
63	"Of the groups listed below, how much do you think they actually do benefit from the protection of forests and wild animals?"	Benefit most	Benefit somewhat	Benefit least	No benefit	Don't know	Benefit most	Benefit somewhat	Benefit least	No benefit	Don't know
	You and your household	5.9%	52.9%	27.3%	8.6%	5.3%	6.9%	72.5%	9.5%	10.1%	1.1%
	Your community	55.3	34.0	6.4	1.6	2.7	37.0	54.5	2.6	4.8	1.1
	Surrounding communities	23.1	52.2	2.7	3.2	18.8	23.3	57.1	8.5	5.8	5.3
	Immigrants: Other Nepali	0.5	53.2	12.4	12.9	21.0	5.8	75.1	8.5	3.7	6.9
	Resident foreigners	2.2	47.3	10.9	13.0	26.6	10.1	65.1	6.9	5.8	12.2
	Non-government conservation organizations	25.9	42.2	4.9	4.9	22.2	19.6	48.7	6.3	2.1	23.3
	Nepal	26.9	51.6	5.4	3.8	12.4	65.1	23.3	1.1	1.6	9.0
	International community	6.5	33.3	14.0	13.4	32.8	4.2	36.0	14.8	12.7	32.3
	Other	10.1	1.6	0.0	0.0	0.5	6.9	1.1	0.0	1.1	0.0
64	"What do you think are the benefits for each of the groups you identified?"	Open-ended question									
65	"Why do you think some of the groups you just mentioned benefit more than others?"	Open-ended question									

Continued

Appendix 4.6: Continued

#	Variable	Royal Chitwan National Park					Annapurna Conservation Area				
66	"Of the groups listed below, how much do you think they actually do benefit from the development programs run by the protected area?"	Benefit most	Benefit somewhat	Benefit least	No benefit	Don't know	Benefit most	Benefit somewhat	Benefit least	No benefit	Don't know
	You and your household	5.9%	51.3%	16.0%	21.4%	5.3%	3.7%	56.1%	12.2%	23.3%	4.8%
	Your community	64.4	22.3	2.1	4.8	6.4	41.3	45.0	1.6	3.7	8.5
	Surrounding communities	23.5	39.0	2.1	4.8	30.5	20.6	52.4	5.3	4.2	17.5
	Immigrants: Other Nepali	2.7	45.5	12.8	13.9	25.1	2.6	46.0	16.9	10.1	24.3
	Resident foreigners	2.2	39.2	4.8	11.3	42.5	3.2	34.4	16.9	14.8	30.7
	Non-government conservation organizations	10.2	39.6	5.9	8.6	35.8	7.9	41.8	7.9	5.8	36.5
	Nepal	13.9	39.0	7.5	7.0	32.6	30.7	45.5	1.6	4.2	18.0
	International community	7.5	27.3	11.2	18.7	35.3	3.2	16.9	8.5	30.2	41.3
	Other	6.4	1.6	0.0	0.5	0.0	1.6	1.1	0.5	0.5	0.0
67	"What do you think are the benefits for each of the groups you identified?"	Open-ended question									
68	"Why do you think some of the groups you just mentioned benefit more than others?"	Open-ended question									
69	"What do you think are the needs of your community? Can you provide examples of these needs?"	Open-ended question									
70	"How would you rank the importance of these needs to you?"	Relevant only to open-ended responses									

Continued

Appendix 4.6: Continued

#	Variable	Royal Chitwan National Park	Annapurna Conservation Area
71	"In regard to the needs you have identified, what do you think are the priorities of the protected area authority?"	Relevant only to open-ended responses	
72	"Have the conservation projects been successful at meeting any of the needs that you have identified?"		
	Yes	8.6%	2.6%
	Somewhat	40.6	64.6
	No	42.2	30.7
	Don't know	8.6	2.1
73	"What projects have been implemented by the protected area?"	Open-ended question	
74	"Have these programs made any difference in terms of improving your standard of living?"	Relevant only to open-ended responses	
75	"How would you rate the protected area authority's ability to deliver benefits to you personally?"		
	Excellent	7.4%	5.3%
	Good	31.9	56.1
	Poor	52.1	31.7
	Don't know	8.5	6.9

Continued

Appendix 4.6: Continued

#	Variable	Royal Chitwan National Park			Annapurna Conservation Area		
		Agree	Disagree	Don't know	Agree	Disagree	Don't know
76	<i>"Do you agree or disagree with the following statements about tourism?"</i>						
	I would be happy to see more tourists here.	95.7%	3.7%	0.5%	100.0%	0.0%	0.0%
	Tourism makes goods and services more expensive.	22.3	73.4	4.3	67.7	29.1	3.2
	Because visitors like to experience our culture, tourism strengthens our cultural traditions.	73.9	12.8	13.3	75.1	13.8	11.1
	Only outsiders benefit financially from tourism to our area.	29.8	61.7	8.5	37.0	55.0	7.9
	Our community has too many tourists.	13.3	84.0	2.7	14.3	83.6	2.1
	Tourists do not respect our local culture and traditions.	17.0	70.2	12.8	23.8	70.4	5.8
	My family has more money because of tourism.	36.2	59.0	4.8	56.1	42.3	1.6
	The financial opportunities offered to me by tourism have adequately offset my losses from conservation.	20.7	66.0	13.3	39.2	46.6	14.3
	Tourism benefits my family.	39.4	55.9	4.8	56.6	42.9	0.5
	Tourism is damaging our culture.	7.2	84.5	8.3	14.9	76.6	8.5
77	<i>"If the resources of the protected area were to be damaged, what would happen to your livelihood activity?"</i>						
	Continue as is	3.2%			6.9%		
	Improve	3.2			4.8		
	Worsen	78.2			82.5		
	End	12.2			3.2		
	Don't know	3.2			2.6		

Appendix 4.7: Questionnaire summary of frequency distributions for participation section

#	Variable	Royal Chitwan National Park			Annapurna Conservation Area		
78	"Do you agree or disagree with the following statements regarding your relationship with the protected area authority and staff?"	Agree	Disagree	Don't know	Agree	Disagree	Don't know
	They are generally helpful and understand our problems, needs and expectations.	68.1%	13.8%	18.1%	67.2%	27.0%	5.8%
	They are not interested in our needs or concerns.	23.9	59.6	16.5	44.4	51.9	3.7
	They are open to our suggestions and concerns regarding development and conservation programs.	75.0	8.0	17.0	69.8	22.8	7.4
	They treat us as equal partners in development and conservation.	77.7	8.0	14.4	67.7	25.4	6.9
	They don't understand our problems and needs.	19.1	63.3	17.6	47.6	50.3	2.1
	They encourage us to participate in conservation and development programs.	83.5	7.4	9.0	81.5	15.9	2.6
	They don't respect our input or appreciate our efforts	10.1	73.0	16.9	30.7	57.7	11.6
79	Participate in committees or groups? (% yes)	60.6%			49.7%		
80	"List all the committees and user groups in which you are a member."	Open-ended question					
81	Leader of group (% yes of those participating)	Relevant only to open-ended responses					
82	"How frequently do you participate in these programs?"	Relevant only to open-ended responses					
83	"Has your participation in development and conservation been beneficial for your family?" (% yes of those participating)	33.3%			80.9%		
84	"Please explain why participation has or has not been beneficial to your family."	Open-ended question					

Continued

Appendix 4.7: Continued

#	Variable	Royal Chitwan National Park				Annapurna Conservation Area			
85	"If you had more free time, would you be able to volunteer for community development or would you need to work to make more money to support your family?"								
	Volunteer	51.5%				67.7%			
	Work	48.5				31.2			
86	"Are there any barriers limiting your participation in development and conservation initiatives?" (% yes)	71.2%				39.2%			
87	"What are the barriers or what prevents you from participating?"	Most significant	Somewhat significant	Not significant	Don't know	Most significant	Somewhat significant	Not significant	Don't know
	Demands from household chores	71.2%	20.9%	7.2%	0.7%	58.4%	31.4%	10.2%	0.0%
	Schedule conflicts with agricultural activities	58.8	24.8	15.0	1.3	43.1	31.4	25.5	0.0
	Schedule conflicts with livestock grazing	13.2	15.1	67.8	3.9	10.9	26.3	62.8	0.0
	Schedule conflicts with other employment	10.7	5.3	79.3	4.7	12.4	8.8	78.8	0.0
	Conflicts with other livelihood activities	24.8	35.3	36.6	3.3	8.8	26.3	65.0	0.0
	Demands of family childcare responsibilities	27.8	20.5	49.0	2.6	24.1	26.3	48.9	0.7
	Protected area policies	4.0	9.9	74.2	11.9	6.6	17.5	65.7	10.2
	The meeting place is too far from my home	3.3	14.5	73.7	8.6	6.7	20.7	68.9	3.7
	Nobody invited to participate	8.6	6.0	75.5	9.9	24.1	35.8	38.0	2.2
	I was not welcomed by others when I participated in the past	2.0	2.6	84.1	11.3	5.1	11.7	80.3	2.9
	I did not know I could participate as well	0.7	7.9	81.5	9.9	28.5	26.3	41.6	3.6
	I do not know how to become involved	7.9	13.2	67.5	11.3	31.4	33.6	30.7	4.4
	I have no free time to participate	46.7	28.9	19.7	4.6	42.3	37.2	19.0	1.5
	Nobody listens to me, so why should I participate	4.0	7.3	78.7	10.0	7.3	8.8	80.3	3.6
	I am not interested in participating	7.3	7.3	78.8	6.7	7.3	5.1	83.9	3.6
	Other	38.7	7.3	0.0	0.0	52.6	0.7	0.0	0.0
88	"What would make you participate more often?"	Open-ended question							

Continued

Appendix 4.7: Continued

#	Variable	<i>Royal Chitwan National Park</i>	<i>Annapurna Conservation Area</i>
89	"Are you happy with the process committee and user group leaders are selected?" (% yes)	84.1%	85.7%
90	"Why are you unhappy with the way committee and user group leaders are selected?"	Open-ended question	
91	"What do you think needs to be changed to improve the selection procedures?"	Open-ended question	
92	"Did the committees and / or user groups you were involved with set any goals for last year? " (% yes of those participating)	84.1%	66.0%
93	"What were the goals for the committees and / or user groups."	Open-ended question	
94	"How effective have committees and user groups been in meeting their goals?"	Relevant only to open-ended responses	
95	"What do you think should change to improve the programs offered by the protected area? Do you have any suggestions?"	Open-ended question	
96	"Is there anything that we have missed or that you would like to comment on? "	Open-ended question	

Appendix 4.8: Questionnaire summary of frequency distributions for road section

#	Variable	Royal Chitwan National Park	Annapurna Conservation Area
A1	<i>"Are you happy that a road to Pokhara is being built?"</i>		
	Yes	-	86.1%
	Somewhat	-	9.1
	No	-	4.3
	Don't know	-	0.5
A2	<i>"What impact do you think the completion of the road to Pokhara will have on your way of life?"</i>		
	Much improvement	-	70.1%
	Somewhat improvement	-	11.8
	No change	-	4.3
	Somewhat worse	-	5.9
	Much worse	-	1.6
	Don't know	-	6.4
A3	<i>"What impact do you think the completion of the road to Pokhara will have on the protection of the forest and wild animals?"</i>		
	More protection	-	8.6%
	No change	-	39.8
	Much less protection	-	40.9
	Don't know	-	10.8
A4	"What do you think will be the positive impacts of the road on your way of life, your community and the conservation of the forest and wild animals?"	Open-ended question	
A5	"What do you think will be the negative impacts?"	Open-ended question	

Appendix 4.9: Guided interview questions for protected area managers and conservation experts

Management

What are the short-term and long term goals of the project?

Do you have any suggestions for improvement in management regimes?

What do you suggest would improve local support for your management goals?

How do you describe the relationship between the park management and local communities? Has it improved or worsened in the last 3 years?

Community attitude/perception

How supportive are the communities of the park/conservation area? Explain why are they supportive or resentful of the park or the management?

Which villages are least supportive of the park? Why do you think some villages are more supportive of conservation programs than others?

What are the reasons local people hunt or trap wildlife?

Do you have any suggestions for better management of wildlife in particular or the whole protected area in general?

Incentive-based programs

Do you think these programs have been successful in generating local support? Please explain.

Are the current incentive programs compatible with your ecological management goals? For example, is ecological integrity at all compromised by incentive programs?

Are development programs implemented in a timely manner?

Are incentive programs likely to benefit the community in the long term? What do you see as the barriers to long term benefit?

Do the benefits intended for the local community actual reach those most affected by conservation? If not, why not?

Has community support for conservation improved with the implementation of incentive programs?

How have incentive-based programs and developments contributed to the larger management goals of conservation? Or, has it caused setbacks on conservation?

Local participation

What do you think are the main motivating factors for local participation?

It is suggested the schedule demands for participation in community development adds to the burden of weaker sections of the society such as women and elderly. How do you determine who should participate and when?

Do you see the need to make any structural or procedural adjustment in your policy and programs to make conservation initiatives more effective? If yes, what are they and how they might be implemented?

Selection of beneficiaries

Have there been any conflicts between villages over allocation of incentive programs in and around the park?

Are there any specific programs or processes in place to ensure benefits from incentive programs reach those most affected by conservation, such as women and low-class groups?

Some research suggests social and political elites use their power, wealth, education and ethnicity to use or manipulate local organizations in their favor and monopolize development benefits. What is your comment on the issue?

Is there anything that the interview missed that you want to comment on?

Appendix 4.10: List of organizations and committees interviewed.

Protected Area and Buffer Zone Managers	Conservation and Development Experts and Agencies	Community and VDC Representatives	Local Committees
King Mahendra Trust for Nature Conservation (KMTNC) (4)	International Centre for Integrated Mountain Development (ICIMOD)	Village chiefs (5, ACA)	Women's Group (ACA)
Department of National Parks and Wildlife Conservation (DNPWC)	Tourism for Rural Poverty Alleviation Program (TRPAP)	Village Development Committee (VDC) and District Development Committee (DDC) (7)	Hotel committee (RCNP)
Participatory Conservation Program (PCP) (DNPWC) (2)	New Era Institute	Community Forest Leaders (RCNP) (5)	Wild Animal Victim's Group (RCNP)
	Mountain Institute (MI)		Women's Empowerment Group (RCNP)
	Resources Nepal		Bird Education Society (RCNP)
	The World Conservation Union (IUCN)		Buffer Zone User Committee (2)
	Canadian Cooperation Office (CCO)		
	Swiss Agency for Development and Cooperation (SDC)		
	Sustainable Development Action Group (SDAG)		
	International Commission on Irrigation and Drainage (ICID)		
	Department of Plants		
	Academic, urban planner, geographer		

Names and positions not provided to ensure interviewees remain anonymous. Numbers in brackets indicate the number of interviews with the organization, when greater than one.

Appendix 4.11: Map of Maoist affected areas in Nepal



Note: This assessment is based on the incidents happened before and after the emergency in place until first week of February 2002, The upper two categories indicate areas outside Government control measures and the lower two categories indicate areas within Government control measures.

Source: United Nations World Food Programme (2002)

So, you guys came to do research. What is the rationale of this research? How is it going to benefit the poor in this area? You guys are all the same. We don't need any elite education, elite knowledge in this country. Your knowledge and research is for the corrupt, oppressive and feudal powers and capitalist rulers who oppress poor, women and downtrodden people. We hate religion, casteism and multi-party political structure, because these are the tools used by feudal and capitalist forces to maintain their control so that they can suck the blood of the poor masses. The knowledge you seek helps nobody but the feudalists and western imperialists who control our resources through aid, donation and so-called technical advice. This is nothing but manipulation. We hate people who seek western education. We don't need advanced education. We just need education and awareness to see the difference between good and evil. We don't need sophisticated education like you seek. We suspect western countries send spies in researchers' guise to work with government in Nepal so that they know our operations and whereabouts. You have to go with us.....we have a place to sleep for you and we will provide you with food.....

So you came to see who are benefiting from the park? Are those poor, helpless people benefiting (pointing to a couple of thatch-roofed huts)? Those who run the park, who run the buffer zone are benefiting. These poor people get absolutely nothing. They have one hope, the people's government (Jana Sarkar). Things will improve under our system. Your research is no different from these corrupt NGOs entering the village to spy on our operation. I will let you go now, but we will be around and will contact you through some means. We will watch your activities. If you are a genuine researcher, you will help us. You will help us by promoting our cause, the cause of the poor of this country who endured decades of hardships, oppression and poverty under a system that is fundamentally wrong, structurally inappropriate in our national system, and functionally biased.

It is still hard to believe that you guys are not park staff, but researchers, uh! I believe it takes more than a bunch of questions to know the truth. You need to find and talk to the people who know things and are not afraid of speaking up. You ask these poor people who don't know much; and even if they do, they won't tell you the truth. They are afraid and don't easily open up to strangers like you.

The truth is this park sits on our ancestors' dead bodies and is soaked in their blood. But what really is sad about the park is that it doesn't belong to us. It is used and abused by the royalty and the so-called noble classes of Nepal for their personal pleasure. This is nothing more than an aristocrat's personal garden with wild animals as pets. Their pets or wild animals are the source of the problems for the poor people living in these villages. We trespass their garden and we are shot. No questions asked, no inquiries carried out, no tears shed. The only law that prevails here comes from the barrel of the army guns. The heartless, feudal aristocrats exploited local labor and stole the trees from the park to build these resorts and houses. But look at the poor people. They are denied the most basic resources they need for survival, something that is traditionally and rightfully theirs. This is their idea of nature conservation. This park is only for the elites, and not for the indigenous people of Chitwan, who have nothing to gain, but everything to lose. We need nature conservation, but not at the cost of the proletariat.

Q: But they created community forests to address the local need for forest resources?

A: I disagree with that. The community forests are too restrictive to meet our demands. There are lots of landless people here. More are coming from different parts of the country. If the community forests are used to meet the growing demands of a growing buffer zone population, then they will soon disappear. I think, the people must be allowed to collect resources such as wood, firewood, fodder, grass and khar from the park. The park opens only for three days for *khar* [grass] every year. People cannot collect all these resources for the whole year in just three days. They need more time to collect enough firewood for the whole year.

It is because of these restrictions that people risk tigers, leopards, other wild animals and the army to go into the park and collect resources. If you are a rich resort owner, you can easily bribe the park staffs to cut trees in the park, but if you are a poor villager you can't even collect a twig in the park. So, essentially the poor have no way, except to steal what they need from the forest. This is the reason we reject the park and its steward. They are one of our many class enemies. Anybody who is the enemy of the people is our enemy.

Q: You are saying the people get nothing from the park and its allies such as INGOs and NGOs who have implemented community development programs in the buffer zone villages including Janakpur.

A: There is a problem with that too. The organizations (INGOs) that fund Buffer Zone programs came to Nepal with their own vested interests. They aren't going to be here forever. Besides, these NGOs and INGOs destroy the fiscal discipline of the country and, of course, that of small villages like ours by flooding the marketplace with money. When there is more money in the marketplace, commodity prices rise, making it harder for low-income people to survive. This is why the gap between the rich and poor is increasing. These organizations are here for money and the resources they don't have in their countries. You must be aware of the hard wood timber from Terai being smuggled into Finland, Norway, Denmark and other European countries. If these organizations really cared for the wildlife and the environment, poaching would have stopped long ago. The rich Western countries these INGOs represent provide the market for poachers and smugglers. It is in their interest to reinforce the existing social and economic disparity and injustice in countries like Nepal so that they can monopolize on the resources. If they really cared for the people and the country, Nepal would have been a rich country already after sixty years of international aid that it has received. On the contrary, it is getting poorer and poorer. Nepal does not need foreign conservation agencies and their money. We need Nepalese to work hard and protect their own resources.

Buffer Zone spends too little to make any real impact on the life of the people or to change the pattern of their resource use, or to mitigate the problems unleashed by the park. People need millions of rupees for projects that help meet their needs such as roads, irrigation, dams, and industrialization, which are nowhere to be seen. Small monetary handouts to the villagers to do small things are just a waste of people's time, efforts and money because they don't bring long term benefits. First, it is external and, for that matter, lacks sustainability as people take time to incorporate the practice into their social structure. Second, the result of these micro remedies is slow to successfully address urgent social problems. So, what I am saying is the so-called

community development programs are nothing more than the tools and techniques of the corrupt bureaucratic machinery to maintain control on local lives and resources.

One other thing I would like to say is the compensation system, which is ridiculous. It has only added to the woes of the people. The compensation for wild animal victims is not just too low, but shows the value park authority have for the villagers. You grow as much as 15 thousand rupees worth of crops on one *katha* land, and if it is all eaten or destroyed by wild animals, all you get from the park in compensation is a mere 20 rupees. Now, isn't that an insult? To make it worse, the process is so lengthy and tedious. Even if you have all the evidence of your losses, it takes three painful days of endless errands and paperwork to get it. A farmer will make more than 20 rupees in three days if he/she were to forget about the compensation and work on the farm instead. There are so many things like these I can talk about. In order to solve these and other larger problems, we must dismantle the existing power structure and bring in the people's government. We need support of educated people like you in our mission.....(political comments not recorded).

Appendix 4.13: Interpreting the strength of Cramer's V measure of association

0	no association
0.01 – 0.09	trivial relationship
0.10 – 0.29	low to moderate relationship
0.30 – 0.49	moderate to substantial relationship
0.50 – 0.69	substantial to very strong relationship
0.70 – 0.89	very strong relationship
0.90 +	near perfect

Source: De Vaus (2002)

Appendix 4.14: Variables, definitions, means

Variable	Definition	Means		
		RCNP	ACA	Total
Demographic Characteristics				
Village Category	1 = DV, 0 = ORV	0.43 ^a	0.55	0.49
Gender	1 = male, 0 = female	0.50	0.48	0.49
Origin	1 = migrant, 0 = native	0.38	0.16	0.27
Wealth	1 = wealthy, 0 = poor	0.17	0.50	0.34
Education	1 = higher than primary, 0 = primary or no education	0.48	0.37	0.42
Age	1 = over 45 years, 0 = under 45 years	0.26	0.40	0.33
Occupation ^b	1 = domestic work, agriculture, 0 = other	0.68	0.57	0.62
Caste ^b	1 = tourism, 0 = other	0.25	0.27	0.26
	1 = low, 0 = other	0.12	0.22	0.17
	1 = middle, 0 = other	0.53	0.68	0.61
	1 = high, 0 = other	0.34	0.10	0.22
Benefits				
Tourism Benefit ^c	1 = yes, 0 = no	0.63	0.44	0.54
	2 = direct, 1 = indirect, 0 = none ^c	0.96	0.69	0.82
<i>My family has more money due to tourism</i>	1 = agree, 0 = disagree	0.57	0.38	0.48
<i>Tourism benefits my family</i>	1 = agree, 0 = disagree	0.57	0.41	0.49
Perception of Benefits ^c	From a low of 0 to a high of 10 ^d	5.26	5.00	5.13
	1 = high, 0 = low ^d	0.53	0.47	0.50
<i>How much does your household benefit from...</i>				
...the protection of forests and wild animals?	3 = most, 2 = some, 1 = little, 0 = none ^c	1.77	1.59	1.68
...development programs run by the protected area?	3 = most, 2 = some, 1 = little, 0 = none ^c	1.42	1.44	1.43
Costs				
Crop damage	1 = yes, 0 = no	0.90	0.65	0.77
	Number of wildlife species named responsible	1.97	1.46	1.72
	1 = high, 0 = low ^d	0.70	0.36	0.53
Livestock depredation	1 = yes, 0 = no	0.45	0.61	0.53
	Number of wildlife species named responsible	0.49	0.73	0.61
	1 = high, 0 = low ^d	0.34	0.50	0.42
Resource dependency ^c	From a low of 0 to a high of 10 ^d	3.17	4.43	3.80
	1 = high, 0 = low ^d	0.46	0.57	0.52
<i>Resource use</i>				
wood / firewood	2 = lots, 1 = some, 0 = none ^c	0.80	1.74	1.27
live trees	2 = lots, 1 = some, 0 = none ^c	0.01	0.11	0.06
plants and herbs	2 = lots, 1 = some, 0 = none ^c	0.15	0.14	0.15
fish and wildlife	2 = lots, 1 = some, 0 = none ^c	0.24	0.02	0.13
land for livestock grazing	2 = lots, 1 = some, 0 = none ^c	0.22	1.85	1.03
<i>Resource need</i>				
wood / firewood	2 = lots, 1 = some, 0 = none ^c	1.79	1.71	1.75
live trees	2 = lots, 1 = some, 0 = none ^c	1.10	0.57	0.86
plants and herbs	2 = lots, 1 = some, 0 = none ^c	0.59	0.68	0.63
fish and wildlife	2 = lots, 1 = some, 0 = none ^c	0.10	0.17	0.13
land for livestock grazing	2 = lots, 1 = some, 0 = none ^c	0.68	0.50	0.60

Appendix 4.14: Continued

Variable	Definition	Means		
		RCNP	ACA	Total
Attitudes^c	From a low of 0 to a high of 10 ^d 1 = positive, 0 = negative ^d	6.81 0.48	8.45 0.75	7.56 0.60
<i>The protected area authorities...</i>				
...try to solve the problems of local residents through development programs.	1 = agree, 0 = disagree	0.89	0.77	0.83
...are generally helpful and understand our problems, needs and expectations.	1 = agree, 0 = disagree	0.71	0.83	0.77
...are not interested in our needs or concerns.	1 = disagree, 0 = agree	0.54	0.71	0.62
...are open to our suggestions and concerns regarding development and conservation programs.	1 = agree, 0 = disagree	0.75	0.90	0.82
...treat us as equal partners in development and conservation.	1 = agree, 0 = disagree	0.73	0.91	0.81
...don't understand our problems and needs.	1 = disagree, 0 = agree	0.51	0.77	0.63
...encourage us to participate in conservation and development programs.	1 = agree, 0 = disagree	0.84	0.92	0.88
...don't respect our input or appreciate our efforts.	1 = disagree, 0 = agree	0.65	0.88	0.76
Linkage Perception^c	From a low of 0 to a high of 10 ^d 1 = strong, 0 = weak ^d	6.60 0.71	3.79 0.38	5.24 0.55
<i>The protected area provides employment to many local people.</i>	1 = agree, 0 = disagree	0.39	0.14	0.27
<i>My livelihood depends on the existence of the forest and wild animals.</i>	1 = agree, 0 = disagree	0.59	0.36	0.48
<i>The protection of the forest and wild animals does not improve the social services in my community.</i>	1 = disagree, 0 = agree	0.74	0.60	0.67
<i>The protection of the forest and wild animals does not improve my standard of living.</i>	1 = disagree, 0 = agree	0.66	0.54	0.61
<i>Improvements to the social services available in my community are due to the presence of the protected area.</i>	1 = agree, 0 = disagree	0.85	0.79	0.82
<i>Tourists come here because of the protected area.</i>	1 = agree, 0 = disagree	0.91	0.23	0.59
<i>If the resources of the protected area were to be damaged, what would happen to your livelihood activity?</i>	3 = end, 2 = worsen, 1 = no change, 0 = improve ^e	1.86	2.03	1.95

^aThe figures in this table that are based on dichotomous variables (those coded 0 and 1) will be expressed in decimal points. These can be converted to the percentage of people in that category. For example, the figure of 0.43 for village category in RCNP means that 43 per cent of RCNP live in DVs. ^bBased on dummy variables created for logistic regression. ^cAs these variables are ordinal, the mean is only presented to facilitate comparisons. ^dMean scores presented are based on relative results for both protected areas together, allowing for direct comparisons between protected areas, but not within. ^eThese variables were created from the data set. The individual questions used to create these variables are listed below each variable in italics.

Appendix 4.15: Statistical tests and relationships explored

Dependent variable	Statistical test	Relationships explored
Demographic variables	Chi-square, Cramer's V	Village category
Wealth (ability to meet livelihood needs)	Chi-square, Cramer's V	Protected area
Reasons to support protected area's existence	Chi-square, Cramer's V	Village category
Benefits identified	Chi-square, Cramer's V	Village category
	Chi-square, Cramer's V	Protected area
Perception of tourism benefit	Chi-square, Cramer's V	Village category
	Chi-square, Cramer's V	Protected area
Categories of tourism benefit (none, indirect, direct)	Chi-square, Cramer's V	DVs (between protected areas)
Categories of tourism benefit (indirect, direct)	Chi-square, Cramer's V	ORVs (between protected areas)
Indirect tourism benefit	Chi-square, Cramer's V	Village category
Direct tourism benefit	Chi-square, Cramer's V	Protected area
Perception of benefit receipt (composite scale)	Logistic regression	Village category
		Gender
		Origin
		Wealth
		Education
		Age
		Occupation
		Caste
	Kruskal-Wallis	Categories of tourism benefit (none, indirect, direct)
	Hierarchical logistic regression	Crop loss (number of wildlife species named responsible)
		Village category
		Livestock loss (number of wildlife species named responsible)
		Resource dependency
	Mann-Whitney U	Protected area
Identified conservation costs	Chi-square, Cramer's V	Village category
Crop loss (occurrence)	Chi-square, Cramer's V	Village category
	Chi-square, Cramer's V	Protected area
Crop loss (number of wildlife species named responsible)	Logistic regression	Village category
		Gender
		Origin
		Wealth
		Education
		Age
		Occupation
		Caste

Appendix 4.15: Continued

Dependent variable	Statistical test	Relationships explored
Keep livestock	Chi-square, Cramer's V	Village category
Livestock loss (occurrence)	Chi-square, Cramer's V	Protected area
Livestock loss (number of wildlife species named responsible)	Mann-Whitney U Logistic regression	Village category Village category Gender Origin Wealth Education Age Occupation Caste
Resource dependency (composite scale)	Mann-Whitney U Logistic regression	Village category Village category Gender Origin Wealth Education Age Occupation Caste
	Mann-Whitney U	Protected area
Attitude toward resource conservation	Mann-Whitney U	Village category
Attitude toward protected area	Mann-Whitney U	Village category
Attitude toward protected area management (scale)	Mann-Whitney U Kruskal-Wallis Hierarchical logistic regression	Village category Categories of tourism benefit (none, indirect, direct) Perception of benefit receipt
	Mann-Whitney U	Linkage perception Protected area
Attitude toward protected area policies	Chi-square, Cramer's V	Village category
Linkage perception (scale)	Logistic regression Kruskal-Wallis Mann-Whitney U	Perception of benefit receipt Categories of tourism benefit (indirect, direct) Categories of tourism benefit (none, indirect, direct) Protected area

Appendix 4.16: Steps for scale creation

Steps	Technique	Example: RCNP Linkage Scale
Choose variables to include based on latent variable to be measured	Based on literature review, include questions in survey to measure latent variable	Questions relating to linkage
Exclude variables with > 90% positive response	Examine frequencies	Due to 100% positive response, the following question was excluded from the scale "It is good the park is protected for our future"
Score variables in same direction	Reverse coding of negatively worded statements; high score corresponds with presence of latent variable	"My livelihood depends on the existence of the forest and wild animals." A = 1, DA = 0 ^a "The protection of the forest and wild animals does not improve my standard of living." A = 0, DA = 1 ^a
Standardize variables to adjust for unequal categories ^b	Divide old variable by standard deviation Calculation: new variable score = old variable score / standard deviation	Linkage scale for RCNP included six questions. Five questions had two categories of responses, while one had four response categories. To ensure each variable had equal representation in the scale, response codes for each variable were divided by the standard deviation for that variable.
Reliability statistics <i>Unidimensionality</i>	Remove variables with item-total correlation > 0.3	Removed following question from RCNP scale due to low item-total correlation: "Tourists come here because of the protected area."
<i>Reliability</i>	Maximize Cronbach's Alpha – ideally > 0.70	Cronbach's Alpha = 0.67
Replace with mean ^{cd}	To minimize missing cases, missing variables were replaced with group mean when cases had < 30% missing variables	Since six variables were included in the scale, cases with two or less variables with missing values had missing values replaced with group mean
Create scale ^c	Sum scores for each variable included in the scale	Six variable scores were summed for each case (person)
Transform scale to fit 1 - 10 ^c	Calculation: new scale score = ((old score – minimum score) / score range) x 10	Minimum score = 0 Maximum score = 17.2 Range = 17.2 New scale score = ((old score – 0) / 17.2) x 10
Create dichotomous variable ^c	Collapse scale into new variable divided by group mean to represent high and low scores relative to group.	RCNP Linkage Scale mean = 6.51 Low linkage = less than 6.51 High linkage = greater than 6.51

^aA = agree, DA = disagree. ^bThis step was only needed for the linkage scale. Variables included in other scales consisted of the same number of response categories. ^cOnly these steps were necessary to create composite scales (perceptions of benefit receipt and resource dependency). ^dOnly the composite scale for resource dependency replaced missing values with means for cases less than 30% missing. Replace with mean was not conducted for the benefit composite scale as only two separate variables were included in this scale.

Appendix 4.17: Benefit categories (Q#64, 67)

Economic Benefits

- Accommodations, tourist facilities
- Airport
- Entry fees, permit fees, forest fees
- Income, business, employment, market for goods
- Road building and repairs, transportation
- Safe Drinking Water Station
- Tourism
- Training

Social Development Benefits

- Agricultural improvements - seeds, irrigation, water mills
- Alternative energy - electricity, back boiler, solar, biogas
- Child education, and care
- Cleanup, garbage control, toilet
- Cultural preservation and promotion
- Drinking water - taps
- General development and social services
- Health care
- Meeting facility construction and repair
- Post office
- Religious support
- Security, safety
- Trails and bridge construction, repairs
- Veterinarian services

Extraction Benefits

- Fertilizer
- Grass, fodder
- Medicinal herbs and mushrooms
- Water
- Wood, firewood

Conservation Benefits

- Benefit for future generations or use
- Forest conservation and reforestation
- Lake conservation
- Recreation, scenic beauty, aesthetics, photography
- Wildlife viewing and existence value

Mitigation Benefits

- Compensation
- Crop / livestock protection
- Village and field protection from river and natural processes

Participation Benefits

- Committees, loans, conflict management
- Conservation awareness, education, study
- Equality / End to discrimination
- Name, recognition, fame, status
- Participation by individuals, friendships
- Sharing responsibility

Appendix 4.18: Reliability statistics for attitude scale (Q#61A, 78)

The protected area authorities...	<i>RCNP</i>	<i>ACA</i>	<i>Both</i>
...try to solve the problems of local residents through development programs.	*	0.39	*
...are generally helpful and understand our problems, needs and expectations.	0.51	0.47	0.50
...are not interested in our needs or concerns.	0.56	*	0.49
...are open to our suggestions and concerns regarding development and conservation programs.	0.61	0.41	0.59
...treat us as equal partners in development and conservation.	0.59	0.42	0.54
...don't understand our problems and needs.	0.64	0.36	0.60
...encourage us to participate in conservation and development programs.	0.46	0.33	0.42
...don't respect our input or appreciate our efforts.	0.48	*	0.42
Cronbach's Alpha	0.81	0.66	0.78
N	182	165	335
Missing Cases	7	23	42

These are corrected item-total correlations. The total scale score against which they are correlated does not include the item in that total. * Not included in scale.

Appendix 4.19: Reliability statistics for linkage scale (Q#61B, D, E, H, J, K, 77)

Components	<i>RCNP</i>	<i>ACA</i>	<i>Both</i>
The protected area provides employment to many local people.	0.31	0.34	0.44
My livelihood depends on the existence of the forest and wild animals.	0.52	0.61	0.60
The protection of the forest and wild animals does not improve the social services in my community.	0.47	0.58	0.49
The protection of the forest and wild animals does not improve my standard of living.	0.49	0.51	0.51
Improvements to the social services available in my community are due to the presence of the protected area.	0.33	*	*
Tourists come here because of the protected area.	*	0.35	0.36
If the resources of the protected area were to be damaged, what would happen to your livelihood activity? **	0.30	0.35	*
Cronbach's Alpha	0.67	0.72	0.72
N	187	176	364
Missing Cases	2	12	13

These are corrected item-total correlations. The total scale score against which they are correlated does not include the item in that total. * Not included in scale. **Adapted from Salafsky and Wollenberg (2000). Responses were coded (0) improve, (1) no change, (2) worsen, (3) end.

Appendix 4.20: Profile of respondents (Q#1, 2, 3, 5, 6, 7, 10, 30)

Respondents' Characteristics	Royal Chitwan National Park						Annapurna Conservation Area					
	Total	Villages		x ²	p	Cramer's V	Total	Villages		x ²	p	Cramer's V
		Destination	Off-route					Destination	Off-Route			
<u>Sex</u>												
Male	50.3%	63.0%	40.7%				52.1%	49.5%	55.3%			
Female	49.7	37.0	59.3	8.276	0.004	0.220 ^a	47.9	50.5	44.7	0.413	0.520	-
<u>Age in years</u>												
18 - 24	16.4	16.0	16.7				11.7	7.8	16.5			
25 - 45	57.1	64.2	51.9				47.9	49.5	45.9			
46 - 64	22.8	16.0	27.8				33.5	38.8	27.1			
65 +	3.7	3.7	3.7	4.044	0.257	-	6.9	3.9	10.6	8.098	0.044	0.208 ^a
<u>Education</u>												
None	36.5	24.7	45.4				34.6	31.1	38.8			
Primary	15.9	12.3	18.5				28.2	27.2	29.4			
Lower Secondary	14.4	13.6	14.8				12.8	12.9	15.3			
Secondary	19.7	21.0	18.5				18.6	24.7	16.5			
University	13.8	28.4	2.8	28.806	0.000	0.390 ^b	5.9	12.9	0.0	11.130	0.025	0.243 ^a
<u>Origin</u>												
Native	61.9	72.8	53.7				84.0	83.5	84.7			
Migrant	38.1	27.2	46.3	6.398	0.011	0.195 ^a	16.0	16.5	15.3	0.001	0.980	-
<u>Occupation</u>												
Housework	20.6	16.0	24.1				11.2	5.8	17.6			
Agriculture	47.1	18.5	68.5				45.7	29.1	65.9			
Tourism	24.9	58.0	0.0				26.6	48.5	0.0			
Other	7.4	7.4	7.4	88.684	0.000	0.685 ^c	16.5	16.5	16.5	60.842	0.000	0.569 ^c

Appendix 4.20: Continued

Respondents' Characteristics	Royal Chitwan National Park						Annapurna Conservation Area					
	Villages			x ²	p	Cramer's V	Villages			x ²	p	Cramer's V
	Total	Destination	Off-route				Total	Destination	Off-Route			
<u>Ability to meet livelihood needs</u>												
No	11.1%	8.6%	13.0%				11.7%	8.7	15.3			
Sometimes	71.4	56.8	82.4				38.3	26.2	52.9			
Yes	17.5	34.6	4.6	28.790	0.000	0.390 ^b	50.0	65.0	31.8	20.715	0.000	0.332 ^b
<u>Land size in hectares</u>												
None	10.1	13.6	7.4				18.6	22.3	14.1			
< = 0.2	36.0	33.3	38.0				58.0	57.3	58.8			
0.3 - 0.4	16.4	13.6	18.5				15.4	14.6	16.5			
0.5 +	37.6	39.5	36.1	2.860	0.414	-	8.0	5.8	10.6	3.140	0.371	-
<u>Caste</u>												
Low caste / untouchable	12.2	9.9	13.9				22.3	11.7	35.3			
Traders <i>Middle</i>	53.4	53.1	53.7				68.1	75.7	58.8			
Brahman / Chhetri												
<i>High</i>	34.4	37.0	32.4	0.904	0.636	-	9.6	12.6	5.9	15.816	0.000	0.290 ^a
<u>Religion</u>												
Hindu	84.7	86.4	83.3				27.1	15.5	41.2			
Buddhist	5.8	3.7	7.4				63.3	77.7	45.9			
Other	9.5	9.9	9.3	1.162	0.599	-	9.6	6.8	12.9	20.558	0.000	0.331 ^b
N	189	81	108				188	103	85			

Cramer's V values only provide for significant relationships. Associations indicated by Cramer's V: ^alow, ^bmoderate, ^csubstantial.

Appendix 5.1: Community needs in RCNP and ACA (Q#69)

