



# LINKAGES AMONG BIODIVERSITY, LIVELIHOOD, AND TOURISM

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**Abstract:** The purpose of this study was to explore the relationships among biodiversity conservation, livelihood improvements, and tourism development using the appreciative inquiry approach as a research tool. The research was conducted in three different buffer-zone communities representing different levels of tourism development around Chitwan National Park, Nepal. The results indicate that tourism helps change local people's attitudes toward the conservation of biodiversity and reduce people's dependence on natural resources. Tourism, particularly small-scale and locally owned ecotourism ventures, is also identified as a tool to enhance the livelihoods of people around protected areas. The linkages, however, vary with the level of tourism development. This study also developed a framework to help understand these linkages. **Keywords:** conservation, pro-poor, appreciative inquiry, protected areas, nature-based, Chitwan National Park. © 2011 Elsevier Ltd. All rights reserved.

## INTRODUCTION

Poverty and environmental degradation are two distinct, yet related, global concerns in the 21st century. It is estimated that as many as 25% of the world's species could become extinct in the next few decades at a rate of 27,000 species per year (Wilson, 1992). To prevent the loss of biodiversity, many protected areas have been established throughout the world. Most protected areas, particularly in developing countries, were established in remote and peripheral regions largely occupied by marginalized and extremely poverty stricken populations (Sanderson, 2005).

The distribution of benefits and costs of conservation, however, are disproportionate. The greatest benefits of protected areas and their bequest and existence values are largely shared by global citizens (Balmford & Whitten, 2003), whereas the costs incurred are absorbed by local communities living near protected areas (Matiku, 2008).

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People who live in biodiversity-rich areas face problems from involuntary displacement to restricted rights of access to resources for their livelihood such as the collection of firewood, fodder, and medicinal plants (Ghimire, 1994; Wells, Brandon, & Hannah, 1992). In addition, loss of livestock and crop-raiding by wildlife are common problems faced by communities in and around protected areas (Nepal & Weber, 1993; Sharma, 1990; Studsrod & Wegge, 1995).

Establishment of protected areas in developing countries largely ignored the needs of local people and further marginalized these communities by restricting their access to resources, which led to a widespread lack of community support for conservation (Ghimire, 1994; Matiku, 2008; Nepal & Weber, 1993; Sharma, 1990). As a result, the relationship between conservation and poverty has received a great deal of attention among scholars and international agencies, including the United Nations (Adams et al., 2004; Sanderson, 2005; Sherbinin, 2008). Although poverty alleviation and conservation are two distinct objectives, there is a strong relationship between them because poverty limits conservation success to a sufficient degree that biodiversity conservation will fail if it does not successfully address poverty issues (Adams et al., 2004).

The Fifth World Parks Congress in 2003 linked conservation with human development and poverty reduction (International Union for Conservation of Nature [IUCN], 2010). The congress recommended strategies to help generate positive economic benefits for local communities, including the payment of the full local opportunity costs of conservation of protected areas in developing countries, social impact assessment of protected areas, and promotion of nonextractive uses such as ecotourism (Adams et al., 2004).

Many case studies have suggested that the relationships between livelihood and conservation (Adams et al., 2004; Salafsky & Wollenberg, 2000; Upton et al., 2008); tourism and livelihood improvement (Ashley, 2000; Cattarinich, 2001; Croes & Vanegas, 2008; Hall, 2007; Harrison, 2008; Ollenburg & Buckley, 2007); and conservation and tourism/development (Brown, 2002; Budowski, 1976; Cater, 1994; Nyaupane & Thapa, 2004; Salafsky & Wollenberg, 2000) are dynamic, complex, and locally specific such that there is no single framework to examine the complex relationships among these global concerns.

The purpose of this study, therefore, is to explore how tourism, particularly nature-based tourism, can help link biodiversity conservation and livelihood improvement. More specifically, this study has two main objectives: to identify themes that help to elucidate the linkages, and to compare the linkages that exist among different stages of tourism development. The paper begins with a review of literature, focusing on tourism and livelihood, and conservation and tourism/development dilemma. To provide context, the paper introduces Chitwan National Park, Nepal, where this study was conducted. The paper describes the method (the appreciative inquiry approach) that was used in this study. In the results section, the paper presents five overarching themes: empowerment, capacity building, economic benefits, biodiversity conservation and environmental services, and amenities

development. These themes were compared among the three communities. The paper then discusses management and policy implications and concludes with a summary of the major findings.

## POVERTY AND TOURISM

In 2004, an estimated 985 million people had consumption levels below US\$1 a day, about 2.6 billion lived on less than \$2 a day, and about 800 million people were hungry (World Bank, 2008). Poverty is often thought of in terms of financial resources only, but poverty also depends on other resources including natural, human, and social capital (Scoones, 1998). To reduce poverty, the United Nations Summit on the Millennium Goals adopted a global action plan to cut poverty levels in half by 2015 (United Nations, 2009). Poverty-focused tourism, such as pro-poor tourism, can be a key player in achieving the Millennium Development Goals by providing an alternative form of income in areas suffering from poverty, hunger, and disease—either directly or indirectly (Scheyvens, 2005; World Tourism Organization [UNWTO], 2010).

Pro-poor tourism is defined as using tourism in a way that creates net benefits to the poor (Harrison, 2008). Its definition implies that the poor benefits from the income provided by tourists, which can lead to more development in the area. The poor can be employed in tourism businesses, establish or run tourism enterprises, or receive donations or support from tourists. Tourism also provides a market to sell goods and services to tourists (Ashley, 2000; Cattarinich, 2001; Scheyvens, 2007). By providing markets for local goods (e.g. farm and non-farm produce) and services, tourism can help maximize supply/demand linkages and minimize leakages (Ollenburg & Buckley, 2007). The revenue generated by taxing the income or profits from tourism can be redistributed to benefit the poor by investing in local infrastructure such as roads, water supplies and electricity, education, and health (Hall, 2007; Scheyvens, 2007).

Indirectly, tourism helps to empower local communities and build capacity which, in turn, improves their livelihoods. Empowerment is a multi-dimensional concept including economic, social, political, and psychological empowerment (Friedmann, 1992; Scheyvens, 1999). Regular economic gains from formal or informal sector employment and business opportunities help economically empower the community (Scheyvens, 1999). Shared income among community members also helps improve local livelihoods by providing infrastructure, education, and health. Some disadvantaged groups, particularly those who do not earn cash, can be empowered through economic opportunities (Agrawal & Gibson, 1999; Nyaupane, Morais, & Dowler, 2006). Social empowerment concerns with the ability of a community to live in harmony and be cohesive (Scheyvens, 1999). Political empowerment is more than the power to vote. It relates to the access of individual household members to the process by which decisions are made (Friedmann, 1992). Finally, psychological power concerns the

self-esteem of community members that can be enhanced by external recognition and appreciation of the unique cultural and natural resources and traditional knowledge (Scheyvens, 1999).

Various types of empowerment could be intertwined as one form leads to the other. For example, if women are socially empowered, it releases their non-economic yet challenging household work, which will free their time that can be used to earn income, which gives them economic empowerment. In turn, it may contribute to self-confidence (psychological empowerment) and political empowerment (Friedmann, 1992). Narayan (2005) showed that the empowerment approach can help reduce poverty by engaging citizens in the development process and strengthening good governance. Some authors have provided an alternative development approach to empowerment, in which public participation and involvement processes have been central (Friedmann, 1992; Brown, 2002). Often, empowerment is considered the final outcome, but the process of empowering people is equally important (Beeton, 2006). Many authors have emphasized the ways communities and households can be empowered through access to information, inclusion and participation, and capacity building (Agrawal & Gibson, 1999; Beeton, 2006; Brown, 2002; Moscardo, 2008; Narayan, 2003).

The goal of capacity building is to secure the empowerment of those who have less economic and political power to reduce their dependency on the government and non-local NGOs by providing new skills related to leadership; understanding the business; solving problems; and expressing their issues, needs, and visions (Murray & Dunn, 1995). The poorest groups in rural communities often lack the necessary skills, knowledge, and resources to participate in tourism-related businesses (Forstner, 2004). In a rural nature-based tourism context, capacity-building programs provide the skills, know-how, and capital necessary to start and operate small-scale tourism enterprises (Victurine, 2000; Weiler & Ham, 2002). This provides the human resources needed to provide quality services to tourists, which are often absent in rural communities (Forstner, 2004; Victurine, 2000). Capacity building ultimately strengthens the people's socioeconomic empowerment.

Broad-based and pro-poor growth are two major approaches to reducing poverty through economic growth (Organization for Economic Co-operation and Development [OECD], 2006). Broad-based growth focuses on developing the overall economy of the region. An increase in employment opportunities and a growth in the overall income of the population can potentially benefit the poor. However, the key questions that arise are how the broad-based growth is inclusive for the poor. For example, how do the poor, particularly women and marginalized groups, participate in, contribute to, and benefit from growth? Therefore, it is argued, rapid and sustained poverty reduction requires pro-poor growth (OECD, 2006). The pro-poor growth approach focuses on improving the conditions of the poor by supporting small- and medium-sized businesses and providing financial capital through micro-credit programs (Cattarinich, 2001).

Cattarinich (2001) further suggested that small-scale, labor-intensive service sectors, particularly those reliant on unskilled labor compatible

with existing farming-based economies, are more favorable for the poor. Instead of replacing the existing farming-based livelihoods of the poor, pro-poor tourism should complement those existing livelihoods by providing opportunities for economic diversification without disrupting or substituting those livelihoods (Ashley, 2000). Tourism also provides additional income when crops are not ready or go bad because of many uncertainties such as weather and crop disease (Ollenburg & Buckley, 2007). Government tourism policies and programs, however, are mostly broad-based approaches focusing on macro-economic growth, job creation, foreign currency earning, and balance of payments. Although governments can still achieve these goals through mass tourism, the economic growth of the poor cannot be assured with broad-based tourism development.

Despite the contributions of pro-poor tourism, the term “pro-poor tourism” embraces a narrow and western-centric view. Although poverty is one of the focuses of livelihood, there are many other community concerns in addition to poverty, such as a lack of power and rights, security, equity, social harmony, and a clean environment (Ashley & Carney, 1999; Baker & Schuler, 2004; Sen, 1999). More emphasis must be given to social inclusion of various groups including women, minorities, and indigenous people (and lower castes, countries where the caste system exists). The concept and definition of “pro-poor” and “poverty” are constructed by those who are not poor, and are imposed on “poor” groups (Cattarinich, 2001). The term “pro-poor” may be appealing to donors, western tourists, and marketers because the term is attractive and sympathetic.

However, local people may not want to be labeled in a way that portrays them as helpless, miserable, and primitive. This has been documented on various occasions.

For example, there was a protest against the Academy Award-winning movie *Slumdog Millionaire*, in the slums of Mumbai, India, where the movie was screened. Protesters shouted slogans saying the movie’s title was humiliating (Chandran, 2009). “Food for the Hungry,” an international relief and development organization, presents the similar western view of the poor. As Pfohl (1994) explained, these terms portray the poor as abnormal losers, and they are stigmatized. Therefore, in this paper, the authors consciously choose the term, “livelihood improvement” instead of “pro-poor,” or “poverty reduction.” Additionally, livelihood, especially sustainable livelihood (SL) approach, helps increase the conceptual understanding of poverty and its causes (Carney, 2003). Chambers and Conway (1991, p. 6) defined sustainable livelihood as:

*the capabilities, assets and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term.*

The sustainable livelihood approach emphasizes people-centered, responsive, participatory, multi-sectoral partnerships, and macro-

micro-level linkages (Carney, 2003; Hussein, 2002). Sustainable livelihood also recognizes the need to diversify the livelihoods and capacities of the rural poor through various strategies including non-farm activities (Ellis, 2000). Sustainable livelihood is interpreted in a variety of ways (Ashley & Carney, 1999). This paper views sustainable livelihood as an approach to development, in this case combining conservation goals and tourism.

### *Conservation and Tourism/Development Dilemma*

The relationship between biodiversity conservation and tourism is complex. At times, biodiversity conservation and tourism appear to be complementary and at other times, they appear to be directly competitive. Tourism development can offer economic justification for the establishment of protected areas for biodiversity conservation (Brandon, 1996; Lindberg, 1991; Ross & Wall, 1999; Walpole & Goodwin, 2001). Additionally, tourism development in protected areas provides an alternative to the exploitative use of environmental resources such as agriculture, cattle farming, forestry, and mining (Beaumont, 2001; Byrne, Staubo, & Grootenhuis, 1996; Ross & Wall, 1999; Weaver, 2000; Wilkie & Carpenter, 1999).

Further, the direct incentive (e.g. employment, and market for local goods and services) or indirect incentives (e.g. infrastructures, health facilities, awareness and education) from tourism development can help develop positive attitudes toward conservation (Stem, Lassoie, Lee, Deshler, & Schelhas, 2003; Walpole & Goodwin, 2001). However, uncontrolled and poorly managed tourism can be a threat to the natural environment, causing irreparable damages to biodiversity (Goodwin & Swingland, 1996; Romeril, 1989). Tourism often takes place in ecologically fragile areas and can impact wildlife, soil, water, and vegetation (Butler, 1999; Williams & Ponsford, 2009).

Protected areas are the major sources of tourism, particularly nature-based tourism. According to the IUCN's World Commission on Protected Areas' (WCPA) seven categories/subcategories, with the exception of strict nature reserves (Category Ia), all categories permit tourism. The traditional approach to protecting biodiversity has been "top-down exclusionary" or the "fences and fines approach" that excludes livelihood activities (Brown, 2002; Salafsky & Wollenberg, 2000; Sharma, 1990). These approaches failed because they treat people as problems and eventually alienate local people. Thus, the local people often become even more impoverished and conservation becomes unsustainable. Realizing these problems, new approaches have been designed and implemented to link the livelihoods of the people to conservation.

There have been some conceptual frameworks to understand the complex relationships between conservation and development. Budowski (1976) developed a framework to explain the relationship between tourism and conservation. According to this framework, three types of relationships may occur between nature conservation and tourism:



conflict, coexistence, and symbiosis. Carter (1994) proposed four possible links between environment and development: win/win, win/lose, lose/win and lose/lose. Salafsky and Wollenberg (2000) developed a conceptual framework comprising three scenarios: no linkage, indirect linkage, and direct linkage. Among these models, the first scenario—symbiosis, win/win, and direct linkage—are the ideal relationship between conservation and development/tourism.

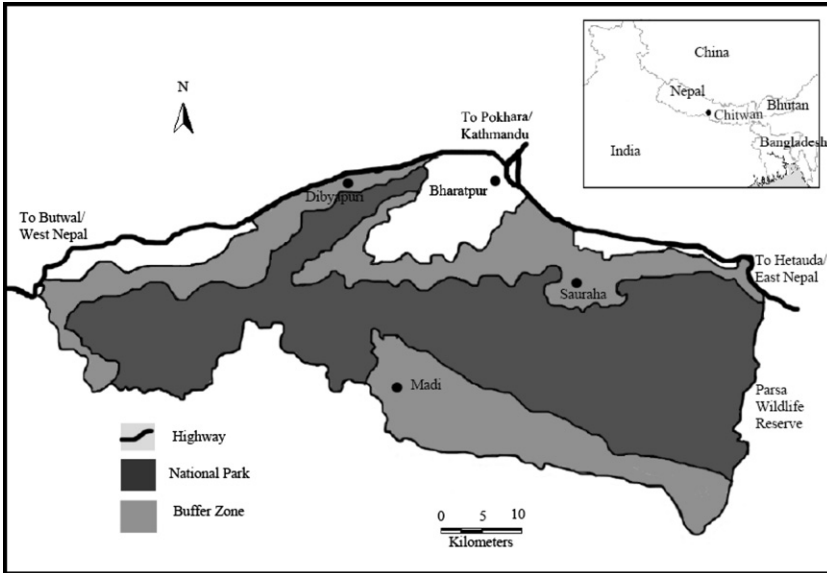
This paper explicitly uses Salafsky and Woolenberg's (2000) conceptual framework because this model tends to cover both theoretical and practical aspects of the linkages. In this framework, the no-linkage scenario includes the traditional exclusionary approaches to conservation. This scenario is rooted in the neo-Malthusian theory that identifies the local people as the root cause of the degradation of biodiversity and natural ecosystems (Adger, Benjaminsen, Brown, & Svarstad, 2001). The indirect-linkage scenario theorizes that if alternate economic activities are provided to local people, those activities will keep people from livelihood activities that damage the local biodiversity (Brown, 2002). Local people are compensated by providing limited access to certain resources in buffer zones and wildlife corridors (Salafsky & Wollenberg, 2000). However, this approach to linkage makes local residents more dependent on external economic incentives that, obviously, are unsustainable. The direct-linkage scenario focuses on developing interrelationships between conservation and surrounding communities to form mutually beneficial relationships. Buffer zone programs and ecotourism activities are the prescribed strategies for creating direct linkages between people and conservation.

## STUDY METHODS

### *Study Area*

Research was conducted in Chitwan National Park, the oldest national park in Nepal, established in 1973 and a World Heritage Site. The park is situated in south central Nepal, covering 932 sq. km in the subtropical lowlands of the inner Terai (Fig. 1). Chitwan National Park shares its eastern boundary with Parsa Wildlife Reserve, Nepal, and southwestern boundary with Valmiki National Park, India. The rest of the area is surrounded by densely populated villages with very sparse and degraded forest areas.

Traditionally, local people depended on park resources for timber, fuel wood, fodder, thatching materials, and other forest products. More importantly, the livelihood of the indigenous people such as *Tharu*, *Bote*, and *Kumal* depended on the forests. Their major foods, such as fish, fruits, seeds, nuts, mushrooms, berries, bulbs, and reeds come from the park. Therefore, the pressure on park resources intensifies with increases in the local population. The major causes of park/people conflict are reduced access to park resources and entry of wild animals to the villages that damage crops, kill livestock, and destroy houses. To link conservation with livelihoods, the government of Nepal



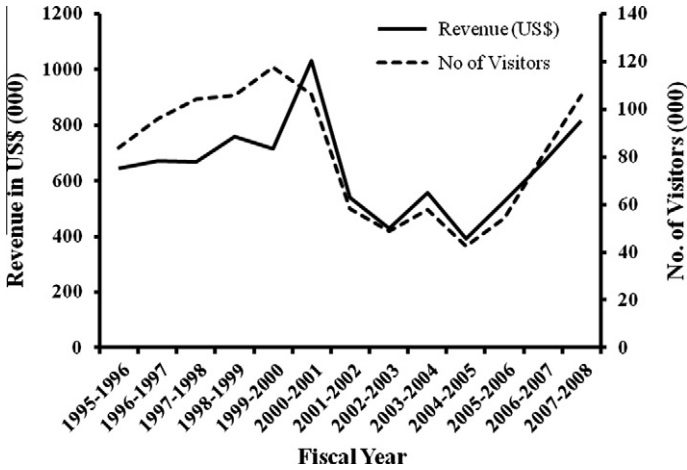
**Figure 1.** Map of Chitwan National Park and Study Sites

introduced buffer zone regulations in 1996 that establish buffer zones around existing protected areas (Paudel, Budhathoki, & Sharma, 2007). In the same year, the area surrounding Chitwan National Park was declared a buffer zone, consisting of forests and private lands, including cultivated lands. The buffer zone is densely populated with a total population of 223,260 people in 750 sq. km (Department of National Parks and Wildlife Conservation [DNPWC], 2008).

The abundance of charismatic mega fauna such as the Royal Bengal tiger (*Panthera tigris tigris*), one-horned rhinoceros (*Rhinoceros unicornis*), gharial crocodile (*Gavialis gangeticus*), Gangetic dolphin (*Platanista gangetica*) and Asian elephant (*Elephas maximus*) has made Chitwan National Park the most popular national park for tourists in Nepal. There is almost a two-fold increase in the number of visitors in Chitwan National Park from fiscal year (FY) 1994–1995 to FY 2008–2009 (Department of National Parks, 2008; Ministry of Tourism and Civil Aviation [MTCA], 2010). The number of visitors in FY 1994–1995 was 64,749 and the figure rose to 117,497 in FY 1999–2000 (Fig. 2). Due to the armed conflict between the government and Maoist insurgents, visitor numbers sharply declined to 58,317 in FY 2001–2002, and the numbers remained below 60,000 until FY 2005–2006. After the end of armed conflict, visitation rates rose sharply in FY 2006–2007, and peaked at 118,685 in FY 2008–2009.

For this study, with the help of park officials, three communities within the buffer zone were selected based on the stage of tourism development, i.e., highly developed, moderately developed, and under-developed areas. Sauraha in Chitwan, Dibyapuri in Nawalparasi, and Madi in Chitwan correspond with highly, moderately, and





**Figure 2.** Number of Tourist Visits to Chitwan National Park and Park Revenue from 1995/1996–2007/2008. Source: DWPWC, 2008

under-developed areas, respectively (Fig. 1). The major criteria for differentiating the stage of tourism development were tourism infrastructure (roads and accommodations) and the presence of tourists in the areas. The data were collected in December 2008 and January 2009 using the appreciative inquiry (AI) process.

*Appreciative Inquiry*

This study adopted the appreciative inquiry (AI) process as a research tool to uncover linkages among biodiversity conservation, tourism development, and livelihood improvements. Appreciative inquiry is a simple, yet powerful, tool that helps the researcher understand rural people’s knowledge, needs, and priorities without alienating them from the research (Cooperrider & Whitney, 2005; Emery, Bregendahl, Fernandez-Baca, & Fey, 2007; Koster & Lemelin, 2009). This approach is suitable for collectivist societies where each member interacts mainly with members of a specific religious, ethnic, or familial group, and they feel involved in the lives of other members of their group (Greif, 1994). In general, most Asian societies, including the communities where this study was conducted, are collectivist, as opposed to individualist (Hofstede, 1983).

Three AI sessions, one in each site, were carried out. We followed the 4-D AI steps with some modifications that include five phases: grounding, discovery, design, dream, and destiny. The grounding phase is the inception phase of the AI process, consisting of rapport building, stakeholder identification, selection of participants, and orientation on research objectives and methods. Many members of the community were initially reluctant to participate. We started building rapport with community leaders to discuss the research’s purpose, the

methodology, and its benefits to the community. The rapport-building process was helpful to gain community support, identify key stakeholders, and select participants. For this study, the stakeholders we identified were government employees (particularly national park employees), local people, non-government and community-based organizations, and tourism entrepreneurs. Our goal was to have five members from each group in each of the three sites. However, some sites had fewer than five participants from each group.

In the discovery phase, participants from each stakeholder group were asked to discuss their exemplary works or major achievements in the protection of the national park and the improvement of livelihoods of the people residing in their community through tourism and conservation. Participants were also encouraged to discuss how these three core areas—conservation, livelihood, and tourism—were interrelated. The discovery phase resulted in several themes. The lists of themes prepared by individuals in each group were compiled and posted on the wall. Next, a list of single, exhaustive themes was compiled. The discovery step exposed which positive outcomes strengthened relationships among biodiversity, livelihood, and tourism. After identification of the themes, we proceeded to the dream phase.

The dream phase refers to co-creating a shared image or vision of the preferred future. In our milieu of research, it means imagining ideal biodiversity, livelihood, and tourism relationships where the exceptional outcomes of the past become the norm rather than the exception. The stakeholders in the dream phase were asked to close their eyes for five minutes and imagine ideal relationships they wish to see among livelihood, conservation, and tourism programs after 25 years. The period of 25 years was chosen because there is a change in generation in every 23–30 years (Cambridge University Press, 2003, p. 519). The dreaming process involved requesting to dream, presenting the image and feelings within the group, co-creating the dream in groups, and discussing the co-created group dream with all participants and facilitators. The participants were encouraged to construct their dreams in visual form, if possible, and many groups created a dream map of their community.

The design phase refers to the process of drawing community socio-technical architecture to achieve the dreams (Watkins & Mohr, 2001). For example, detailed plans include education and training, leadership, policies, strategy, technology, governance, employees, and infrastructure to enable the dream to become reality (Cooperrider, Whitney, & Stavros, 2003; Watkins & Mohr, 2001). In this step, the participants were asked to prepare plans and answer basic questions about each activity that they planned, including where, when, how, and by whom to see their dreams reach fruition. The data from this phase are useful for planning and are only partly used for this paper.

The destiny phase, previously called the delivery phase, addresses how to empower, learn, and adjust/improvise. It is the time of realization of the dream due to the work done in the design phase and simultaneously the moment of continuous learning, adjustment, and improvisation (Watkins & Mohr, 2001). Stakeholders were asked what

they learned from the AI process. Participants were encouraged to discuss the outcomes of the process and the aspects of the AI process that can be implemented in their communities. The team reflection at the end of the session was very positive. Participants commented that the AI process initiated mutual trust, respect, appreciation, and realization of a common goal.

## LINKAGES AMONG BIODIVERSITY, LIVELIHOOD, AND TOURISM

Participants identified five overarching themes—empowerment, capacity building, economic benefits, biodiversity conservation and environmental services, and amenities development—that link biodiversity conservation, livelihood improvement, and tourism development (Table 1). These themes emerged primarily from the first two phases of the AI process.

### *Empowerment*

Both biodiversity conservation and tourism development contribute to various dimensions of empowerment. The government of Nepal started buffer zone programs to preserve rare flora and fauna, improve the livelihoods of people living around protected areas, and reduce park-people conflict. The formation of buffer zone community forests has provided legal authority to local people to manage nearby forests

**Table 1. Five Themes of Linkages**

| Themes   | Attributes  |
|--|---|
| Empowerment  | Access to information<br>Access to conservation education programs<br>Access to forests and traditional use rights<br>Influence in planning and decision making process                     |
| Capacity Building                                    | Opportunities to participate in skill development training<br>Opportunities to participate in income generating activities<br>Availability of small loans                                   |
| Economic Benefits                                    | Employment opportunities in tourism business<br>Market for local farm produce<br>Market for non-farm produce<br>Opportunities for microenterprises<br>Collective economic benefits          |
| Biodiversity Conservation and Environmental Services | Participation in biodiversity conservation program<br>Protection of forests in the buffer zone area<br>Conservation awareness<br>Activities to reduce pressure on forest and park resources |
| Amenities Development                                | Local Infrastructure<br>Conservation infrastructure (trails, forest roads, fences, etc.)<br>Tourism superstructure<br>Development of tourism products                                       |

and ensured their traditional use rights. By the end of 2004, 3,622 ha of forest land had been handed over to 22 buffer zone community forest user groups benefiting 9,990 households around Chitwan National Park (DNPWC, 2010). A buffer zone provides the rights to use forest and park resources, and guarantees traditional-use rights.

Establishment of buffer-zone user groups, committees and council help to empower local communities politically. There are 22 user committees and each of the committees has 12–100 user groups based on size and population (Chitwan National Park, 2009; DNPWC, 2008). A user group consists of an average of 22 households and there are a total of 1,484 user groups. The user group members elect committee members, and the committee members select a Buffer Zone Management Council, the highest level of elected representatives to manage the buffer zone around the national park. The buffer zone committees are based on a grassroots approach that fosters the democratic process. Local residents are actively involved at every level of planning and decision-making through these groups, committees, and the council.

Biodiversity conservation and tourism development enhance information access to locals, which contributes to social and political empowerment. The park authority and organizations related to tourism and conservation regularly update and publish information in various forms including pamphlets, resource maps, articles, etc. They are disseminated to a wide range of audience including the general public, tourists, and tourism entrepreneurs. The other means of providing information are documentaries, hoarding boards, radio and television broadcasts, and the Internet. Furthermore, information can be obtained from various individuals and organizations upon request. Information directly or indirectly helps create awareness of the importance of biodiversity conservation and the role of tourism in livelihood improvements, and helps to maintain transparency. There are some specific awareness activities mainly focused on biodiversity conservation such as conservation education, street plays, conservation-related quiz contests in local schools, and interaction programs.

### *Capacity Building*

Unlike farming, the major livelihood source in rural communities, tourism is complex and its success depends on higher levels of skills and knowledge to market and provide services to tourists. There are various capacity-building activities, primarily skill development and leadership training, and small loans are provided to local residents. The major training programs provided in the communities around Chitwan National Park were leadership, biodiversity conservation, skill development, income generation, nature guiding, and ecotourism.

Some of the skill and income-generating training programs organized through the buffer zone program for locals included beekeeping, fisheries, veterinary, vegetable and fruit production, nature guide, and hotel operations. Many training programs focused on enhancing the livelihoods of indigenous people, low-income groups, and women. They were

also provided small loans for training in poultry, pig, and rabbit farming; sericulture; handicrafts; carpentry; and plumbing. Women received training programs in sewing; painting; and candle, chalk, and wallet making. These training programs provided the skills locals needed to shift from traditional subsistence farming to cash crops, such as vegetable farming and poultry farming. Many families have started and operate small-scale off-farm tourism businesses, such as souvenir shops, restaurants, and hotels. Many local youths are also hired as guides and cooks. These capacity-building programs enabled local residents, particularly the poor and women, to be independent. Most importantly, the major source of funding for the training comes from tourism revenue generated by the national park.

### *Economic Benefits*

The incentive to local people—in the form of cash and/or material—is an important factor in strengthening the interrelationships between biodiversity and livelihood. Biodiversity conservation programs hire local people for the implementation of various activities and contribute to the local economy. Instead of replacing farming, tourism helps provide a market for farm produce. Various income-generating activities were enacted to increase income that link agriculture with tourism. Local produce such as vegetables, chicken, eggs, fish, and arts and crafts, are easily sold to local hotels, restaurants, and tourists. Farmers can easily shift to more marketable crops. Instead of selling raw products, there are many ways for locals to make value-added products. For example, many women made jam and jelly from locally produced fruits. Similarly, timber from the buffer zone forests is used to make wooden souvenirs that are sold to tourists at much higher prices than selling timber in the local market. Furthermore, the management of buffer zone translates into forest products including firewood, timber, fodder and grass for livestock, which is the major source of cash for farmers by selling milk and other dairy products.

Most importantly, tourism created a significant number of jobs through hotels, restaurants, guest houses, travel agencies, and souvenir shops. The demand for locally produced goods like food, beverages, and handicrafts also soars as visitation numbers increase. Most farmers traditionally relied on subsistence agriculture for their survival. Tourism helps farmers earn the extra cash needed to pay for health services, send children to school and college, and pay utility bills. There are many uncertainties, such as weather and disease that could impact agricultural production. For many farmers, tourism income helped create an economic buffer if agriculture is not enough to maintain their livelihoods. Tourism also provided opportunities for self-employment. Many people around the national park have established new businesses with low investments, e.g. opening souvenir shops, small-scale poultry farms, and small bed-and-breakfast-type inns.

Tourism and conservation have also contributed to the collective economic benefits of the communities. The buffer zone program is a collaborative and participatory program in which 30–50% of the park's income is spent on local development. For example, Chitwan National Park received \$816,571 (1\$ = NPR 72; NPR 58,793,101) as revenue, 90% of which comes from tourism, in FY 2007–2008 (DNPWC, 2008) (Fig. 2). Of this revenue, 34.77% (\$283,934 or NPR 20,443,218) was allocated to buffer zone development. Each community received about NPR 500,000 (US\$6,944). The communities spent the money on various natural-resource management and community development programs in the buffer zone. In the 13-year period between the inception of the buffer zone program in 1996 and FY 2007–2008, \$3,434,197 (NPR 247,662,187) was allocated to buffer zone development (DNPWC, 2008).

### *Biodiversity Conservation and Environmental Services*

Biodiversity conservation is the main objective of the national park. Charismatic mega fauna and their fascinating behaviors are the primary attractions for tourists. Therefore, the park supports nature-based tourism activities like elephant riding, canoeing, wildlife viewing, bird watching, and boating. Additionally, the conservation of the ecosystem provides a number of environmental services, like fresh air, clean water, soil conservation, watersheds, soil fertility, and open space to the communities. Buffer zone programs, with the assistance of NGOs, have helped local farmers establish biogas plants that have contributed to conservation and livelihoods. With the establishment of biogas plants, locals need not to rely on local forests for firewood for cooking. By FY 2005–2006, 797 biogas plants were established in the communities surrounding Chitwan National Park (Chitwan National Park, 2009).

The source of biogas, a renewable energy, is animal waste. Therefore, locals must keep their livestock (cows and buffaloes) captive, rather than letting them graze in the forest. Grazing is considered one of the major causes of forest and habitat destruction. Biogas also helps improve health and sanitation, and is also cost-effective for families because they do not have to spend time and energy collecting firewood.

### *Amenities Development*

Sufficient infrastructures are required to support biodiversity conservation, improvement of livelihood, and tourism development. The infrastructures common to all purposes are roads, culverts, bridges, community buildings, electricity, schools, and water supplies. The trails, forest roads, embankments, and watch towers built for conservation purposes serve as infrastructures for tourism as well, and the artificial lakes and picnic ramadas built for tourists are used by locals.



For example, traditionally, the *Botes*, an ethnic group of the region, fish in the local river. They are not allowed to fish in the river inside the national park, but are permitted to fish in the artificial lakes created in the buffer zone area.

In FY 2005–2006, the buffer zone council spent \$ 99,973 (1\$ = NPR 72; NPR 7,198,065) in the buffer zone area. The council spent 71% of the money on infrastructure development activities such as the construction of roads (4 km), culverts (8), and causeways (2) that help link these villages to major roads. The rest of the money was spent on conservation programs (15%), income generation and skill development (8%), conservation education (3%), and administrative cost (3%) (Chitwan National Park, 2009). The locals also contributed (labor or cash) to local development. In FY 2005–2006, locals contributed 55.54% of the total expenditures of the buffer zone development activities (Chitwan National Park, 2009).

One major activity under the conservation program is the erection of various types of fences to protect local farmers' crops from wildlife: barbed-wire fences, mesh-wire fences, bio-fences, and electric fences. These measures help increase agricultural production per unit of land and decrease environmental degradation by enabling farmers to increase production without encroaching on forests and public lands. Previously, farmers had watch towers on their farms to scare wildlife, particularly at night. This has been one of the most successful programs in reducing the conflict between the park and the people and helped increase local support for conservation. Additionally, tourism amenities such as restaurants, shops, and recreational areas both positively affect local livelihoods and help conservation goals.

#### *Comparison of Linkages at Different Stages of Tourism Development*

Three buffer zone sites were selected based on the stage of tourism development of the site, i.e., highly developed, moderately developed, and under-developed areas, including Sauraha, Dibyapuri, and Madi, respectively (Fig. 1). The five themes discussed above were used as an analysis framework and the findings were presented in the format that suggests how strong or weak these linkages are in each of the three sites.

Although it is evident from all three sites that there are linkages among biodiversity conservation, livelihood improvement, and tourism development, stakeholders' perceptions about the nature and extent of these relationships vary greatly among the three sites. Overall, local people are more empowered in all of the communities because of tourism and buffer zone programs. However, this varies with the level of tourism development. Local residents in Sauraha, a highly developed tourism site, are more empowered than residents of the other two communities because there were more economic opportunities in Sauraha, which provided socio-economic empowerment. Similarly, only the people of Sauraha have access to various sources of information like

pamphlets, resource maps, articles, documentaries, hoarding boards, radio and television broadcasts, and the Internet. People in Madi have little to no access to these sources of information. Sauraha is the major tourist hub of Chitwan National Park and plays a crucial role in the regional and national economy as well. Through economic development, the people of Sauraha are more politically empowered than those in the other two communities.

In all three areas, capacity-building activities such as skill development and income generation training programs have been conducted. There are additional training opportunities in Sauraha, such as nature-guide training and tourism entrepreneurship training. Capacity-building activities were more targeted to local ethnic groups such as *Bote*, *Kumal*, and *Majhi*. In Sauraha, a tourism entrepreneurs group and a network of organizations working at the local level have been formed. The people of Sauraha are frequently involved in the planning and decision-making related to conservation and tourism, while for the other communities, these opportunities are limited. Because of the higher level of awareness and presence of strong civil society organizations for advocacy, the people of Sauraha have been influential in the policy formulation process.

All three communities agreed that conservation and tourism provide income for the local economy, generate employment, and provide various materials to support livelihoods, but the level of impact is not the same. Hotels, restaurants, guest houses, travel agencies, and various other establishments are mostly concentrated in Sauraha and have been providing employment opportunities to local people. Similarly, there is a better market in Sauraha for locally produced materials like fruits, vegetables, and handicrafts that provide higher incomes to local people. Income-generating activities such as vegetable farming, sericulture, aquaculture, and non-timber forest products (NTFP) farming are also concentrated in Sauraha. The benefits of tourism and conservation are still incipient at Madi. As predicted, Sauraha, a highly developed tourism site, has the highest level of amenities development, followed by Dibyapuri, a moderately developed site, and Madi, the least-developed site. There were no notable differences in resource conservation and management. However, local residents in Sauraha have a greater awareness of biodiversity conservation, followed by Dibyapuri and Madi.

## MANAGEMENT AND POLICY IMPLICATIONS

The findings have some management and policy implications regarding the management of protected areas and tourism in developing countries. Some studies revealed that tourists will pay more than the existing entrance fee to the park (Baral, Stern, & Bhattarai, 2008; Goodwin & Swingland, 1996). Therefore, the entrance fee should be determined carefully, such that the park can generate maximum revenue to fund conservation and livelihood improvement programs without decreasing the number of tourists visiting the park.

Further, tourists are willing to pay more if they have information about the fees and trust on public agencies (Nyaupane, Graefe, & Burns, 2009). Managers of protected areas, therefore, should provide information to tourists about why fees are collected and where the fee dollars go, and gain trust through more accountability and transparency (Nyaupane et al., 2009).

The costs of biodiversity conservation—such as reduced access, wild-life loss, involuntary displacement, etc.—are shared by residents in or adjacent to protected areas (Balmford & Whitten, 2003; Matiku, 2008; Walpole & Goodwin, 2001). Therefore, distribution of benefits should take into account equity concerns so that the first beneficiary of tourism development is those who suffered the most from conservation activities. The indigenous people, women, and residents of areas adjacent to national park should be the first beneficiaries (Lindberg & Enriquez, 1994).

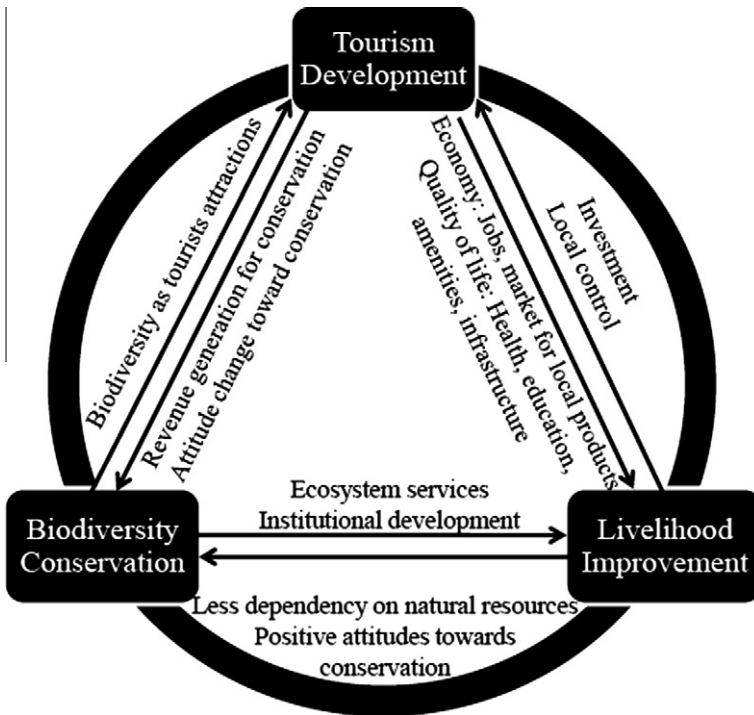
The findings of this study have some implications for policy makers as well. Appropriate government policy and institutional arrangement are key to establishing and maintaining direct linkages among conservation, livelihood improvement, and tourism. Historically, it was assumed that human activities are responsible for the loss of biodiversity and the only way to conserve biological diversity is to confine them in isolated places (Brown, 2002; Nepal & Weber, 1993; Sharma, 1990). The “fence and fine” approach to conservation largely failed because it encroached on people’s rights to use resources and ignored livelihood issues (van der Duim & Caalders, 2002; Wilkie & Carpenter, 1999). Therefore, this study suggests that traditional conservation approaches, in which tourism and local communities are considered threats to conservation, must be revised to consider linkage a management tool. The rationale behind the buffer zone programs is an ecological and social economic buffer that benefits both conservation and neighboring communities (Heinen & Mehta, 2000). Buffer zone programs can potentially help create direct linkages (Salafsky & Wollenberg, 2000). Nepal’s participatory, community-based conservation programs have been considered successful models (Agrawal & Ostrom, 2001). In particular, buffer zone programs have been successful in strengthening linkages that can be expanded to other developing countries to ensure the ownership of the benefits of conservation among local residents and providing access to resources for locals.

Overall, this study reveals the linkages among biodiversity conservation, livelihood improvement, and tourism development. However, the relationships vary greatly among the three sites. The linkages are stronger in highly developed tourism sites than in moderately- and least-developed sites. Local residents in the highly developed site are more empowered and have more economic opportunities. They are, as a result, more supportive of conservation programs than other sites. Therefore, park managers should consider tourism a major tool to improve the linkages between biodiversity conservation and livelihood improvement.

**CONCLUSION**

The paper identified five overarching themes to understand the complex relationships among biodiversity conservation, livelihood improvement, and tourism development, including: empowerment, capacity building, economic benefits, biodiversity conservation and environmental services, and amenities development. Tourism and conservation activities provided many skills-development, income-generating, and leadership training opportunities for local residents. These training programs help locals get jobs and start small-scale tourism-related enterprises. Tourism has also been a major source of revenue for the park and the revenue has been spent on funding conservation and livelihood improvement programs. When people’s livelihoods improve, they can invest more into the tourism industry and exercise greater control. This helps reduce leakages and increases empowerment of the local community.

Tourism also provides access to information and amenities, and promotes conservation education and awareness among local residents. This can help change local people’s attitudes toward the conservation of flora and fauna, reduce dependency on natural resources, and promote biodiversity conservation. Similarly, the conservation of biodiver-



**Figure 3. Linkages among Biodiversity Conservation, Livelihood Improvement, and Tourism Development**

sity and natural resources provides environmental services to local residents and can be a major tourist attraction, which are the main incentives for conservation. The two-way relationships among biodiversity conservation, livelihood improvement, and tourism development are summarized in Fig. 3. The degree of linkages, however, varies based on the stage of tourism development. The linkages are more positive and stronger in developed tourism site than in less-developed sites. In the sites where tourism is highly developed, people receive more economic benefits, are more empowered, and take more pride in the national park than the other sites. **A**

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