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# Ecotourism's Support of Biodiversity Conservation

MARNIE P. BOOKBINDER,\* ERIC DINERSTEIN,|| ARUN RIJAL,† HANK CAULEY,‡  
AND ARUP RAJOURIA§

\*World Wildlife Fund-US, Conservation Science Program, 1250 24th Street NW, Washington, D.C. 20037, U.S.A.

†Nepal Conservation Research and Training Centre, P.O. Bachhauri, Sauraha, Chitwan District, Nepal

‡Biodiversity Conservation Network, c/o World Wildlife Fund-US, 1250 24th Street NW,  
Washington, D.C. 20037, U.S.A.

§King Mahendra Trust for Nature Conservation, P.O. Box 3712, Kathmandu, Nepal

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**Abstract:** *Ecotourism is often viewed as effective for promoting the conservation of endangered species and habitats in developing countries. By creating economic incentives for impoverished villagers or their communities, ecotourism is thought to encourage local guardianship of biological resources. To assess ecotourism's effect on the income of villagers living near Royal Chitwan National Park, Nepal, one of the most heavily visited parks in Asia, we randomly surveyed 996 households in 7 of the 36 Village Development Committees adjacent to the park. Despite a 1994 visitation rate exceeding 60,000 tourists—most from industrial nations—the economic impact of ecotourism on household income was minimal and limited to villages closest to the main park's entrance. Of the estimated 87,000 working-age people living near the park, less than 1100 were employed directly by the ecotourism industry. Only 6% of the surveyed households earned income directly or indirectly from ecotourism; the average annual salary of these households from ecotourism was \$600. Ecotourism in Royal Chitwan National Park, as it is currently structured, provides little employment potential, has a marginal effect on household income, and offers few benefits for local people. Thus, it is not a panacea for long-term biodiversity conservation in this case. New policy changes, coupled with alternative approaches to the privately owned ecotourism industry, however, have the potential to redirect an appreciable amount of revenue to local development and strengthen local guardianship of endangered species and habitats. We urge that conservation biologists working in other areas ensure that well-defined mechanisms for profit sharing with local communities are in place before advocating ecotourism development. Where ecotourism programs already exist without such profit-sharing mechanisms, we urge conservationists to press for legislation that permits a percentage of profits to be spent on local community development.*

Soporte del Ecoturismo a la Conservación de la Biodiversidad

**Resumen:** *El ecoturismo es frecuentemente visto como un medio efectivo para promover la conservación de especies y hábitats amenazados en países en desarrollo. Se cree que el ecoturismo promueve la custodia de los recursos biológicos locales al crear incentivos económicos para pobladores de bajos recursos en las comunidades aledañas. Para evaluar el efecto del ecoturismo en los ingresos de los pobladores que habitan cerca del Parque Nacional Royal Chitwan, en Nepal—uno de los parques más intensamente visitados en Asia—encuestamos al azar 996 familias en 7 de los 36 Comités de Desarrollo de Villas adyacentes al parque. A pesar de que la tasa de visitas en 1994 excedió los 60,000 turistas—la mayoría provenientes de países industrializados—el impacto económico del ecoturismo en los ingresos familiares fue mínimo y limitado a las villas más cercanas a la entrada del parque. De las 87,000 personas en edad de clase trabajadora que viven cerca del parque, menos de 1,100 fueron empleadas directamente por la industria del ecoturismo. Únicamente 6% de las familias encuestadas reciben ingresos directamente del ecoturismo; el salario promedio anual de estas familias fué de \$600 USD. En la manera en que se encuentra estructurado actualmente el ecoturismo en el Parque Nacional Royal Chitwan, provee un potencial de empleo pequeño, tiene un efecto marginal en el ingreso familiar y ofrece pocos beneficios a las comunidades. Debido a esto, este caso no es una panacea para*

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||Address correspondence to E. Dinerstein, email [eric.dinerstein@wufus.org](mailto:eric.dinerstein@wufus.org)  
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la conservación a largo plazo de la biodiversidad. Cambios en nuevas políticas acoplados a formas de abordar alternativas para la industria privada del ecoturismo tienen el potencial de re-dirigir una cantidad apreciable de ingresos hacia el desarrollo local y fortalecer la custodia local de especies y hábitats amenazados. Urgimos a los biólogos de la conservación que trabajan en otras áreas que aseguren que los mecanismos de distribución de las ganancias con los pobladores sean bien definidos antes de que se proponga el desarrollo del ecoturismo. En los lugares donde ya existen programas de ecoturismo sin estos mecanismos de distribución de ganancias, urgimos a los conservacionistas para que presionen por una legislación que permita que un porcentaje de las ganancias sea canalizado hacia actividades de desarrollo en las comunidades locales.

## Introduction

Conservationists have been challenged to design effective biodiversity conservation strategies in economically impoverished but biologically rich areas of the developing world. Increasingly, conservation programs are experimenting with economic incentives designed to provide benefits for local stakeholders and, in theory, make them partners in saving species and wildlands (Western & Wright 1994; Biodiversity Conservation Network 1995). Two conditions must be met to ensure the successful integration of biodiversity conservation and local economic development: (1) the identification of economic incentives that provide immediate benefits to local people and (2) the identification of economic incentives that are appropriate in space and time to the scale of threats to biodiversity (Dinerstein et al. 1998). The extent to which these economic incentives are derived from conservation activities rather than from direct financial compensation (e.g., paying a farmer for domestic cattle killed by tigers) is even more desirable for sustainability.

One strategy that has been embraced as an ideal mechanism for attaining both economic and ecological success is ecotourism. To succeed on both of these levels, an appreciable amount of revenue must return to local communities to foster stewardship and to change local practices so that biologically valuable habitats, populations, and ecological processes are conserved. We examine the effectiveness of ecotourism in providing sufficient economic incentives for biodiversity conservation in Royal Chitwan National Park (RCNP), Nepal. We also address several important issues related to the impact of economic incentives derived from ecotourism, including (1) the direct or indirect effects of the privately managed ecotourism industry on the household income of local villagers living along the periphery of RCNP; (2) the concentration or distribution of economic benefits from ecotourism in villages adjacent to the park and major hotels; (3) the effect on the livelihoods of local nature guides, a group of stakeholders often viewed as major beneficiaries of ecotourism programs; (4) the major difficulties with ecotourism as it is currently structured in RCNP; and (5) viable alternatives to the privately owned ecotourism industry in RCNP.

## Study Area

Our study was conducted in the buffer zone adjacent to RCNP, Nepal, one of the most popular destinations for foreign ecotourists in Asia. The 932-km<sup>2</sup> park, located in the relatively flat, low-lying Terai zone, encompasses an important mosaic of alluvial grasslands and riverine forests that once dominated the Gangetic and Brahmaputra plains (Dinerstein & McCracken 1990). The last intact fragments of these biologically important habitat types are limited to RCNP and a few other protected areas at the base of the outer foothills of the Himalayas. These habitats support the highest recorded densities of tigers and the second largest population of greater one-horned rhinoceros (*Rhinoceros unicornis*) in Asia (Dinerstein & Price 1991; Dinerstein et al. 1997). Unfortunately, poaching and habitat loss due to fragmentation, degradation, and conversion to agriculture continue to threaten the tiger and rhinoceros populations found in RCNP and adjacent habitats.

The RCNP is bordered on three sides by 36 village development committees (village committees) supporting a total population of over 260,000 people (His Majesty's Government of Nepal 1994). Our study area encompassed 7 of these Village Committees along the northern border of the park, with an estimated population of 64,000. The majority of villagers are subsistence-level farmers of Tharu descent, an ethnic group indigenous to the Terai. The remainder are from hill tribes that resettled in the late 1950s after the eradication of malaria. The annual per capita income is approximately \$150 (U.S.), and more than half of the population earns less than \$100 annually (Keiter 1995).

## Privately Owned Ecotourism Business in RCNP

Large numbers of tourists travel to RCNP each year due to the accessibility of the park, the opportunity to view rhinoceros at close range on elephant-back, and the possibility of seeing a tiger in the wild. The number of tourists has increased annually, stimulating a dramatic increase in hotel construction in Sauraha, a small, rural ward in the Bachhauli Village Committee on the border of RCNP (Fig. 1). Sauraha is the epicenter of ecotourism;

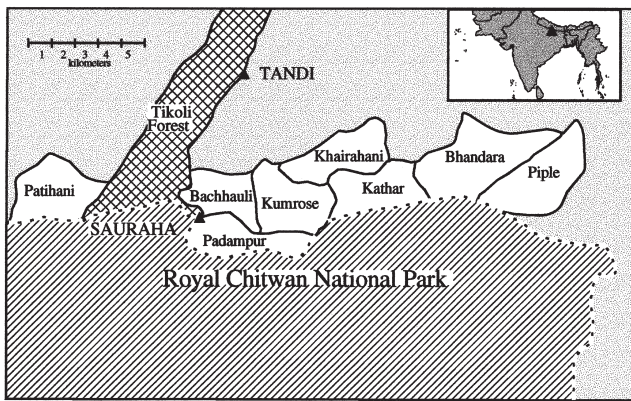


Figure 1. Map of Royal Chitwan National Park and the seven village development committees in the study area. Padampur was not included because this area is in the process of being resettled.

the main entrance to the park and the highest concentration of ecotourist hotels are located in this ward. Since the early 1980s, the number of privately owned ecotourist hotels there has steadily increased. In October 1995 there were 46 relatively inexpensive hotels in Sauraha and 7 larger, more expensive hotels inside the park. Three of these hotels were built before 1980, 31 in the 1980s and 19 in the 1990s.

## Methods

### Where Ecotourism Dollars End Up

To assess the economic impact of ecotourism on the local economy, we studied the local hotel industry operating both inside and outside RCNP. Three questionnaires were developed and six local Nepalese were trained to conduct a survey of hotel managers and employees in March 1995. A total of 144 interviews provided information on hotel ownership, package tour rates (including food, lodging, and tourist activities for 2 days and 3 nights), visitation rates, employment levels, and employee salaries.

The amount of revenue generated by the hotel industry for the 1994 tourist season was then estimated to determine the portion of proceeds garnered by the local community. This estimate is based on package tour rates and visitor numbers recorded for each hotel in the hotel survey. To determine the contribution of different types of hotels (low-budget cottages, medium-priced hotels, and expensive hotels) to local employment, we stratified the data collected from the hotel survey by package tour rates and daily rates. Forty-nine hotels were surveyed during the 1994 tourist season (three hotels were

closed and one hotel was under construction at the time of our study).

We also randomly interviewed 108 tourists staying at hotels in Sauraha and at the larger hotels inside the park. The tourist questionnaire was designed to estimate visitor spending on RCNP excursions and to identify trends in reservation bookings. We also sought information on tourists' willingness to pay to determine at what price the park entry fee will yield the greatest return.

### Earning Capacity of Nature Guides

The demand for and employment of locals as nature guides in RCNP is one of the most beneficial contributions of ecotourism to the local economy. Although the majority of guides are employed by hotels, many operate their own private businesses. Therefore, to capture complete information on the effects of ecotourism on the livelihood of locals it was necessary to conduct a separate study of nature guides, in addition to the hotel survey. The nature guide survey was conducted in August of 1995 to determine the average annual salary earned by nature guides working in the privately owned ecotourism industry. All hotels in the area were visited and 140 nature guides working in the local ecotourism industry were interviewed (65% of the estimated number of trained guides in the RCNP vicinity). When possible, nature guides not employed by these hotels were contacted by fellow guides and interviewed.

### Effects of Privately Owned Ecotourism on Household Income

To determine the distribution and magnitude of economic benefits from ecotourism to local villagers, we collected information on both direct and indirect household income generated by work or activities related to ecotourism. We randomly surveyed 996 houses in 57 wards nested within seven village committees along the periphery of RCNP, or approximately 9% of the households in those seven village committees. The seven village committees in our study area were Bachhauli, Bhandara, Kathar, Kumrose, Khairahani, Patihani, and Piple (Fig. 1). These village committees were selected because of their proximity to the main entrance of RCNP in Sauraha, the center of ecotourism activities. All seven village committees were located within 2 km of the park boundary and within 15 km of Sauraha. We defined direct economic benefits as personal income generated by employment in the industry (e.g., nature guiding, elephant driving, or cooking for hotels) and indirect economic benefits as total revenue (price  $\times$  quantity sold) from the sale of products or the provision of services related to ecotourism (e.g., souvenir sales, cultural dance performances, or independent guiding separate from hotels). The data were used to cross-check salary estimates reported by hotel owners in the hotel survey.

## Results

### Assessment of the Ecotourism Industry

The peak tourist season in RCNP is October through April. During the 1992 tourist season, 57,000 tourists visited RCNP, accounting for 17% of all tourists visiting Nepal and 75% of all tourists visiting Nepal's national parks. Visitation figures showed that during the 1994 tourist season 64,749 tourists visited RCNP, a 24% increase from the 1990 tourist season (Table 1). Of those 64,749 tourists, the majority of foreign visitors to RCNP were from India (15%), the United States (9%), and Germany (6%). In respectively decreasing numbers, the remaining tourists came from England, Holland, Japan, France, Taiwan, and a number of other countries. Steadily on the increase, almost 84,000 tourists visited RCNP in 1996, including 46,610 from industrialized nations.

According to information collected from our employee survey, the average wage of villagers (in U.S. dollars) employed by the hotel industry was approximately \$28 (SD = \$24) per month or \$336 per year (exchange rate in 1994, \$1 U.S. = 50 Nepalese rupees [NR], and in 1997 \$1 U.S. = 53 NR). These figures were slightly lower yet similar to those quoted by hotel managers of approximately \$32 per month or \$384 per year (Table 2). Employees in the RCNP ecotourism industry therefore earned approximately 2.5 times the national annual per capita income in Nepal for 1994, but this does not exceed by much the lowest level of poverty in this country of \$100 per capita per year.

The RCNP hotel industry, which included the 49 hotels in operation at the time of this study, generated an estimated total revenue of \$4.5 million in 1994. The capacity of local communities to capture this revenue, however, is limited. Sixty-one percent of hotels are owned by non-locals, either Nepalese from outside the Chitwan District or expatriates. The hotel industry in RCNP employed approximately 1100 villagers, representing only 1% of the district's total working-age population. Based on our 1994 employment figures and 1991 population data, the hotel

industry in RCNP supported, at most, 3% of the population in Chitwan District; this figure is likely to be lower considering the natural rate of population increase since 1991 (currently estimated at 2.7 per year). In 1994 approximately 72% of employees in the hotel industry were locals, originally from the Chitwan District, but less than 2% were women.

The existing package tour rates in RCNP attract bargain-seeking tourists; 55% of tourists in 1994 stayed at low-budget cottages and medium-priced hotels with an average package tour price of \$66 (SD = \$51). The current 2-day park entry fee is \$13 (Nepalese tourists pay only a nominal fee to enter RCNP). Of the 119 tourists from industrial nations surveyed in our study, 39% stated that they would be willing to pay more to enter the park, 52% said they would not, and 9% were uncertain. The average increase in willingness to pay among the amenable tourists was \$6.50 (SD = \$3.50, median = \$8).

### Earning Capacity of Nature Guides

Of the 140 nature guides surveyed, 104 (74%) were permanent residents of the Chitwan District and 26% were recent migrants who had moved to the area within the past 5 years from other districts in Nepal and India. Similar to the hotel survey, only 2% of the nature guides we surveyed were women. For junior nature guides, the average monthly salary prior to nature guide training and certification was \$16. After participating in the nature guide training program and receiving certification, their average monthly salary increased by 36%. The average monthly salary for senior nature guides in 1994 was \$29, a 29% increase from wages earned prior to senior guide training and certification.

### Effects of Ecotourism on Household Income

Only 44 households (4% of those surveyed) reported having family members directly employed in the eco-

**Table 1.** Number of tourists visiting Royal Chitwan National Park, 1990–1996.

Tourist season	No. of tourists*
1990	36,500
1991	43,750
1992	55,335
1993	55,442
1994	58,934
1995	64,749
1996	83,898
1997	96,062

\*Tourist-season totals are calculated from 15 July, at the end of the Nepalese fiscal year. The total for the 1990 tourist season therefore includes tourists who visited the park between 15 July 1989 and 15 July 1990.

**Table 2.** Employee and tourism information on the three classes of hotels operating in the Royal Chitwan National Park during the 1994 tourist season.<sup>a</sup>

Hotel type	No. of hotels	No. of employees	Average salary/month (U.S. \$)	Package price (\$) <sup>b</sup>
Low-budget cottage	28	253	21.91	0–49
Medium-priced hotel	10	174	29.96	50–99
Expensive hotel	11	657	41.04	100–230
Total	49	1084	30.97	

<sup>a</sup>Data based on hotel employee survey of 1994.

<sup>b</sup>Package price paid by tourists for food, lodging, and tourist activities for 2 days and 3 nights. The hotels were classified according to package rates.

tourism industry. The average monthly salary of those employed by the ecotourism industry was \$41, an estimate slightly higher but similar to wages reported by hotel employees. Another 2% of the households in our survey earned money from the sale of products or the provision of services associated with ecotourism. The average direct and indirect income per household, for the 6% of houses affected by ecotourism, was approximately \$50 per month, or \$600 per year. Of this \$50, the average amount earned through direct employment was \$34, and that earned through indirect activities related to ecotourism was \$16.

The distribution of economic benefits to households from ecotourism was limited geographically. Ecotourism's economic impact on households decreased dramatically with distance from Sauraha (Table 3). Even within the Bachhauli Village Committee, the households affected by ecotourism were concentrated primarily in the Sauraha ward. Besides Sauraha, other wards adjacent to hotels did not receive the monetary benefits we had expected.

## Discussion

### Shortcomings of Privately Owned Ecotourism Businesses

Our findings show that the current economic benefits to local communities from the ecotourism industry in RCNP are limited. The employment potential of ecotourism is low, and the direct economic impact of ecotourism on household income is marginal. Further, the indirect impact of ecotourism on household income is virtually nonexistent; few households reported receiving money from the sale of products or provision of services related to ecotourism. This paucity of profits indicates minimal market diversification from this macroenterprise.

Furthermore, some of the profits generated by the hotel industry are siphoned from the local economy through advance bookings made in other countries or in the capital city of Kathmandu. We estimated that 54% of hotel res-

ervations are booked and paid for in advance, outside of Sauraha. Until relatively recently, most hotels rarely purchased food grown locally.

The predominance of low-budget ecotourist hotels, highly discounted package tours, and inexpensive park entry fees for RCNP means that ecotourism is undervalued.

It can be argued that the employment of more than 1% of the work force in Chitwan is important and that this percentage would be higher for other reserves that are not characterized by high population densities such as those occurring around RCNP. But high population densities in rural areas is a phenomenon of subtropical and tropical Asia. If incentives do not reach the communities where the other 86,000 working-age adults live, there is no reason for them to view the park in a positive manner or to refrain from collecting firewood, starting fires, or poaching wildlife.

To foster greater local support for biodiversity conservation, a bylaw was enacted in February 1996 decreeing that 50% of park entry fees and a portion of concessionaire taxes must be dispensed to the local communities affected by park protection policies. Prior to this provision, all park revenue was diverted from RCNP and the local economy to the Ministry of Finance. Only a small fraction of this money was reinvested in the park, and no revenue was distributed to the local community. Now, there is a legal mechanism to distribute ecotourism revenue to local village groups.

Important lessons can be learned from the Chitwan experience by conservationists in other developing countries who consider ecotourism a powerful incentive for conservation. First, privately based ecotourism, with a structure similar to that found in RCNP prior to 1996, is essentially exploitative and unlikely to put enough money into local communities to effect a change in local attitudes toward conservation unless it is operating in areas with extremely low population densities. Second, 25 years of experience in the buffer zones of RCNP convince us that local support for biodiversity conservation requires a combination of co-ownership, comanagement, and policy change. Recent policy reforms in Nepal have changed the

**Table 3.** Summary of direct and indirect monthly household income (U.S. \$) from ecotourism in our study area.

<i>Village committee</i>	<i>No. of houses surveyed</i>	<i>Houses affected (%)</i>	<i>Indirect income</i>	<i>Direct income</i>	<i>Total income</i>	<i>Average monthly household income*</i>
Bachhauli	179	22 (40/179)	494	1910	2404	60
Kumrose	180	6 (11/180)	290	80	370	34
Kathar	180	1 (2/180)	0	86	86	43
Khairahani	45	2 (1/45)	24	0	24	24
Patihani	135	3 (4/135)	28	4	32	8
Bhandara	137	2 (3/137)	100	20	120	40
Piple	140	1 (1/140)	18	0	18	18
Total	996	6 (62/996)	992	2100	3092	50

\*Average monthly household income was calculated by dividing total income by the number of households that receive indirect or direct benefits from ecotourism (households affected by ecotourism).

exclusive character of the industry by linking biodiversity conservation with community development through the 1996 recycled revenue bylaw. Finally, ecotourism in RCNP is a tourists' market: tourists pay only a few rupees for their jungle experience, the low-budget hotels capture only a small proportion of potential profits, and, ultimately, local economic conditions do not improve. There are no restrictions on hotel construction outside the park, no limitations on visitation numbers in the park, and minimal tourism planning and management both within and along the periphery of the park by the Sauraha Hotel Association or the Nepalese government. Few hotels ever run at full capacity, there are no minimum prices set for tourism activities (except park entry fees), and the majority of hotels offer highly discounted package tours.

### Toward an Equitable Return of Ecotourism Revenues

The structure of the privately owned ecotourism industry until recently has provided little incentive for people living adjacent to RCNP to support biodiversity conservation: they received essentially no monetary return. It would seem that the remarkable success achieved in RCNP in restoring its rhinoceros and tiger populations is attributable largely to strict protection by the Nepalese army and park staff, the law-abiding nature of Nepalese citizens, and the absence of firearms among the rural populace, rather than from any incentive program (Dinerstein et al. 1998).

A new, community-based microenterprise approach to ecotourism is being tested in two communities bordering RCNP, however, and is demonstrating a potential to change revenue distribution. This alternative to the privately owned ecotourism industry, which was developed by the Biodiversity Conservation Network and the World Wildlife Fund in collaboration with the villages of Bagmara and Kumrose, has been an initial success. In its first year of operation, the Bagmara village group generated over \$280,000 in revenue from tourists viewing wildlife on elephant rides in the restored habitats under the management of this group (Dinerstein et al. 1998). This enterprise not only directed a substantial amount of revenue to local development, but it has simultaneously strengthened local stewardship toward biodiversity conservation. This integrated conservation and development program restored over 16.5 km<sup>2</sup> of wildlife habitat, which was recolonized by 43 endangered rhinoceros and five tigers (Dinerstein et al. 1998). These community-managed tourism areas, owned by local village groups, have become an important attraction for tourists. Coupled with the recycled revenue program implemented by the Nepalese government, community-based ecotourism can foster changes in local attitudes toward wildlife and ultimately have the intended result: endangered species and habitat conservation and increased benefits for the people of Nepal. Based on our experience in RCNP, we urge that conservation biologists working in other areas ensure that well-defined mecha-

nisms for profit sharing with local communities are in place before advocating ecotourism development. We urge conservationists to press for legislation that permits a percentage of profits to be recycled to local community development. As of 1998 recycled revenues are contributing roughly \$400,000 per year to local development within a 750-km<sup>2</sup> buffer zone of RCNP. In Nepal and in other developing nations, legislation that enables local communities to receive substantial annual revenues has the potential to change the face of endangered species conservation.

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