

## Mountain Tourism Impacts

### Introduction

The previous chapter attempted to provide a concept of mountain tourism in the context of environmental resources and mountain development. In this chapter, the various impacts that have resulted from tourism practices in the mountain areas are reported. There have been socioeconomic, cultural, environmental, and other physical impacts of tourism. These impacts can be direct, indirect, positive, or negative, but often they are difficult to compartmentalise in this manner since the impacts may be spread over a wide area and are also not directly attributable to tourism. The analysis relies on numerous secondary sources, namely, studies conducted in different areas of the mountains. The coverage of mountain areas where tourism occurs is also not uniformly distributed, with a maximum number of studies conducted in the Sagarmatha region, in particular, and protected areas in general. Furthermore, these studies vary in their coverage and, often, considerable time lapses between two similar studies. This chapter discusses the various types of impacts and concludes by identifying some major issues related to the mountain environment and mountain tourism.

### Tourism Impacts

The bulk of mountain tourism in Nepal is conducted in protected areas. Major socioeconomic changes among the local people in the protected areas have occurred as a result of tourism. Although local people have made rational attempts to maximise opportunities introduced by tourism, the effects on conservation have not always been positive, as will be discussed below. In the case of Nepal, based on the literature, the impacts can be categorised under different headings. The major impacts associated with tourism in mountain areas can be classified as related to:

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|-------------------|-------------------|
| 1) land use,      | 2) litter,        |
| 3) pollution,     | 4) forest,        |
| 5) sociocultural, | 6) income, and    |
| 7) employment,    | 8) other impacts. |

Other impacts of tourism that do not fall under the above categories, and on which literature is very minimal, e.g., on women, will also be briefly discussed in this chapter.

### **Land Use**

In the mountain areas, fertile lands are seldom available. Due to the long and harsh winters, cultivation practices are difficult, generally with one crop season per year and very low yields. The steady growth of tourism in mountain areas has affected agricultural practices and land use. Although the impact of tourism on land use is not well recorded, studies have noted land use changes that may be attributed to tourism. The changes in land use cited refer to changes in the crops cultivated or the cropping pattern; converting land from forestry to agricultural use; conversion of agricultural land to build lodges or tea stalls; and leaving land fallow to rent as camp grounds.

Tourism has brought economic opportunities to remote areas of Nepal where agriculture and animal husbandry were traditionally the main occupations of most households. In areas, such as Sagarmatha National Park, as well as Tatopani and Bagarchap villages in the Annapurna Conservation Area (ACA), agriculture has gradually become secondary to tourism-related activities such as the operation of lodges, working as guides or kitchen boys, or working in tourism-related services in Kathmandu (CEDA 1988; Friend 1983; Haimendorf 1984; Stevens et al. 1993b).

In parts of the Sagarmatha National Park, many households have abandoned their traditional cropping practice of buckwheat and barley to cultivate more potatoes because of tourism. Potatoes find a ready cash market (Upadhyay 1984). Some land use changes are reported in the ACA in the Tatopani region (Friend 1983). Households along the trekking routes have begun cultivating fruit and other high-value crops. Furthermore, Friend (1983) reports that increasing amounts of land around Tatopani have gone out of agricultural production. Also, the productivity of some crops has declined because local people sometimes change planting time to accommodate the tourism season.

In the area immediately adjoining SNP and lying between Jorsalle (the park entrance) and Lukla, another observed land use change is the increased number of households cultivating fruit (apples and peaches). Again, fruit is readily sold to tourists (Upadhyay 1984). At higher elevations within the park area, climatic conditions prohibit fruit farming. In Bagarchap village in the Annapurna Conservation Area, households have shown preference for fruit and vegetable farming

over traditional crops. Chettri et al. (1992) also discuss the impact of tourism on land use in terms of horticultural activities in the Jomsom-Marpha area.

Changes in the cropping pattern are positive so long as they help mountain people earn a relatively better income than from traditional cultivation practices and the changes do not harm the environment. From both angles, the land use changes occurring appear to have made a positive contribution. For example, in the case of Rasuwa district, where Langtang National Park is situated, profit per hectare has been found to be much higher under fruit cultivation than under traditional crops (Table 4.1). Also, from the point of view of long-term sustainability, given the land holdings (less than 0.005 ha per capita, Yonzon 1993) and the poor quality of soil, agricultural development (a traditional practice) cannot be seen as a viable sector for development (Banskota and Sharma 1993b).

In terms of forest land encroachment, no appreciable change has been observed within the SNP area, which may be due to land zoning and strict monitoring by park authorities (Upadhyay 1984). Using a repeat photography approach, Byers (1987) arrived at a similar conclusion.

The construction of new buildings, however, is a visible sign of land use impact in many of these protected areas frequented by tourists (Byers 1987).<sup>1</sup> Aside from park headquarters and other buildings, construction of lodges and tea stalls has occurred extensively in Sagarmatha National Park (SNP), Annapurna Conservation Area (ACA), and Langtang National Park (LNP), both inside and outside the park area. In SNP and LNP, smaller temporary lodges have also been created at higher altitudes to cater to tourism. In the newly created Makalu-Barun National Park and Conservation Area (MBNP/CA), land use changes have occurred along the Makalu-Base Camp trail in the conservation area as well as outside the MBNP/CA area. Currently, these changes are in the form of lodge construction at Tumlingtar, Chichila, and Num, which fall outside the MBNP/CA, and in Sheduwa and Tashigoan, inside the conservation area. In the area adjoining the MBNP/CA, some recent changes can also be attributed to the proposed Arun III hydroelectric project.

Another indirect change in land use in some mountain areas brought about by tourism is the change in livestock composition. In the SNP area, the use of *zopkio* (yak/cow crossbreed) as pack animals has increased because of its high

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1 Similar observations have also been made in the case of the Swiss Alps (Messerli 1987) and India (Shah and Panday 1992; Singh 1992).

cash return (Brower 1984; Upadhyay 1984). As Brower reports, *zopkio* are often used to substitute for porters because of the high cash returns (a *zopkio* carries three to four porter loads). The increased number of these pack animals has put enormous pressure on grazing land. *Zopkio* also trample cultivated *bari*. Since these pack animals are used mainly to carry tourist loads, mountain tourism has brought changes in herd composition, resulting in increasing competition for grazing land as well as for fodder. Members of the *Thakali* ethnic group have also sold out their traditional livestock, preferring to own pack animals in some parts of the ACAP area (Friend 1983). Joiner (1986/87) has argued that buffaloes kept by lodge-owners for the production of milk and milk products have also put additional pressure on surrounding forests for fodder supply.

### *Litter*

The increasing amount of littering taking place at high altitudes in the mountains is a major negative environmental impact that has received a great deal of attention in Nepal. Litter includes non-biodegradable rubbish such as plastics, glass bottles, tins, foil, and batteries, improperly deposited or discarded along trails, at campsites, outside trekking lodges, and at base camps, by tourists, trekking staff, porters, trekking lodge staff, and local residents; inadequately covered toilet pits and scattered toilet paper around campsites and on trails are another problem (Lama and Sherpa 1994).

The dimension of this problem is serious. In one study, it is estimated that an average trekking group of 15 people generate about 15kg of non-biodegradable, non-burnable garbage in 10 trekking days (Lama and Sherpa 1994). Table 4.2 provides an idea of the amount of litter deposited in protected areas as well as in other areas visited by tourists and their support staff and porters. Add to this, the litter and garbage deposited by mountaineers (Table 4.2), which is considerable.

The generation of so much garbage is a serious concern, especially in the mountain environments where decomposition is an extremely slow process. Furthermore, the non-biodegradable, non-burnable garbage - if not transported out - simply piles up year after year and ruins environment, vegetation, livestock, habitats, etc. Add to this, the problem of the environment's assimilative capacity at high altitude. As an example, it takes about 60 years for a juniper to reach a height of 35cm (Bjonness 1980). Recycling problems must undoubtedly take considerable time as well. The problem is serious especially since a great deal of the litter is non-biodegradable or non-burnable.



Other environmental impacts observed are those of unsanitary garbage disposal and littering along trails and campgrounds. The trail to SNP has been called the "Garbage Trail." In the ACAP area, there is such a plethora of signboards advertising soft drinks that the trail is referred to as the "Coke Trail." The Langtang trail has sometimes been called the "Toilet Paper Trail." Although the magnitude of the impact of littering along trails has not been assessed, such labelling suggests the extent of the problem. In the ACAP region, where the King Mahendra Trust for Nature Conservation (KMTNC) and local people have been able to generate an awareness of sanitation and cleanliness among tourists as well as lodge-owners, this problem has not abated. Some information on the Langtang National Park (LNP) area compiled by Banskota and Upadhyay (1989) is presented in (Table 4.3).

### *Pollution*

The pollution of water sources from setting toilets too close to streams and drinking water sources (both lodge latrines and portable trekking toilets tents), use of chemical soaps for bathing, and the washing of dishes and clothes in streams or close to water sources have been reported. Water pollution can also be caused by disposing of human waste directly into rivers and streams - as is customarily done by lodge owners, a common practice also of local people (Lama and Sherpa 1994; Gurung 1990). In one instance in the Barun Valley, declared to be a strict nature reserve, Sherpa cites the incidence of giardia, an intestinal illness caused by consuming water contaminated with human or animal faeces (Lama and Sherpa 1994). Sickness from contaminated water and food was also reported by trekkers in LNP (Banskota and Upadhyay 1989).

The disposal of kitchen waste water into streams and ponds is another source of water pollution. The use of water courses as a means of waste disposal by local people is yet another cause of water pollution (Gurung 1990). In the absence of health and sanitation awareness, facilities, and moral persuasion, this dimension of environmental degradation related to mountain tourism will be difficult to control. Tourists who visit such areas have to be sensitive to the environment. The number of tourists that visit mountain areas is close to 70,000, and it is likely to grow; in the absence of waste and garbage disposal management, this can be a serious problem in mountain environments.

### *Forests*

One of the most widely discussed topics on the mountain environment is forest degradation and deforestation. The demand for firewood by tourism and asso-

ciated tourism activities in the mountain areas has the most significant effect on forests, vegetation, and wildlife. Seasonal demand for firewood in high alpine pastures is another source of firewood demand that disrupts the high altitude vegetation. During three to four months of the year (tourism off-season), cattle are grazed in these high alpine pastures and large quantities of firewood are used to boil milk and process cheese (Lama and Sherpa 1994; Yonzon 1993).

Firewood demand by tourists is believed to be a primary source of forest degradation in the mountains. Recently, HMG restricted the use of firewood by trekkers in most national parks, which are also the main areas for tourism. But in the absence of law enforcement and monitoring and because of the lack of a cheap alternative source of fuel the use of firewood has not stopped.

The different tourists and related groups that demand firewood are as follow:

1. tourists;
2. lodges, hotels, tea houses, and private homes that entertain tourists; and
3. porters that accompany trekkers

Three factors that put pressure on firewood demand are: some areas are visited by tourists who outnumber the local people; the firewood demand is seasonal, lasting from three to five months in a year; and growing seasons in the mountains are extremely short and harsh.

Table 4.4 highlights this situation in the three popular protected areas. In all three areas, the demand for firewood by tourists exceeds that of the local people, even though tourism in these areas is seasonal. The pressure on forests is obvious, as the tourist demand for firewood can be met only by paying a price, which gives local people the incentive to cut trees. In this sense, the forest degradation process can be assumed to have been exacerbated by tourists. The daily firewood requirement of rural households for cooking meals or heating has not been considered here since this demand is not caused by tourism. However, as local people's incomes increase from tourism, their demand for firewood is likely to increase by what may be called the income effect.

The demand for firewood also differs for free independent trekkers (FITs) and group tourists. This difference in consumption arises because group tourists are

self-supporting in food, shelter, and fuel for cooking-as demanded by HMG law-while travelling in protected areas. Travel or trekking agencies that cater to these group tourists must ensure that no firewood is used during the trips. This is also true for mountaineering teams as well. However, the enforcement has not been effective enough to make this policy a overwhelming success (Lama and Sherpa 1994; Banskota and Upadhyay 1990; Gurung 1990). Also, group tourists are accompanied by porters and other support staff who depend heavily on firewood for cooking and for warmth on cold nights. Thus, as the number of tourist groups increase, the demand for firewood by porters and support staff also increases. The same cannot be said about FITs, who generally depend on local outfits (lodges, tea houses, and homes) for food and accommodation. Therefore, the demand for firewood by this group is a derived demand that is reflected in the demand for firewood by lodges, tea houses, and local homes. When the overall consumption of firewood by group tourists is compared with FITs, group tourism consumes a greater amount than FITs (Table 4.5).

Estimates on fuelwood consumed by tourists in the mountain areas vary (Tables 4.5 and 4.6). The estimates presented in Tables 4.5 and 4.6 indicate this variability and also partially the difficulties in estimating firewood consumption by tourists. These estimates vary, depending on the season, place visited, length of stay in a place, and the type of tourism activity carried out.

Individual trekkers depend on local lodges or hotels, tea houses, and homes for food and accommodation. In a study in SNP, 30 per cent of the visitors were individual trekkers, out of which 73 per cent ate in lodges or tea houses (Tables 4.7 and 4.8). Only 18 per cent of the lodges/tea houses/hotels kept kerosene, implying that 82 per cent of the lodges/tea houses/hotels depended on firewood. Also, significant numbers of group trekkers are known to purchase firewood locally, in spite of regulations

The porters that accompany all types of tourists are heavy consumers of firewood. They rely entirely on firewood for cooking and for warmth in colder regions. However, the firewood consumed by porters is reported to be less than that consumed by the '*Sahibs*' on a per capita basis (Bjonness 1980). But when total quantities consumed are compared, firewood consumed by porters is more significant as every tourist is accompanied by approximately two porters (Upadhyay 1984; Bjonness 1980).

It is possible to provide an idea of the magnitude of firewood annually consumed by tourists in the mountain areas using estimates provided by

Gurung (1990) and Banskota and Upadhyay (1991b). Some results are shown in Table 4.9.

The quantity of firewood consumed by tourists is enormous. Even though firewood use by group trekkers and mountaineers are banned inside national parks, the rule has not been strictly followed. Outside protected areas, this rule is most likely not adhered to at all. In the estimates in Table 4.9, the consumption of firewood does not include consumption by local people. The per capita fuelwood and timber demand of local people is estimated to be about 0.588 mt and 0.079 cum/yr, respectively (Master Plan for the Forestry Sector [MPFS] 1987). In protected areas, the consumption of firewood and timber thus adds up significantly. In certain regions, there has been an increase in the traffic of animals carrying loads because of tourists. For example, 65,000 pack animals are reported to pass through the Tatopani area, resulting in overgrazing and loss of vegetative cover (Friend 1983). Also, an estimated one hectare of forest area around Ghorepani disappears annually as a result of catering to tourist demands for fuelwood.

It is not only deforestation that destroys the mountain environment. Another important factor, it should be realised, is that, when firewood or timber is harvested at high rates, the loss in biomass is also significant and can have damaging effects on vegetation and habitats. Lopping of dwarf junipers for fire at base camps by mountaineering teams has been a common phenomenon (Byers and Banskota 1993). The cumulative effect of removing this vegetation on the fragile slopes when coupled with a dense flow of tourists and their entourages can be devastating (Shrestha et al. 1990). Off-trail hiking and firewood collection can impact a much larger area than the immediate vicinity around the trail. This problem is compounded by the fact that tourism in these areas occurs during off-growing seasons, when weather and soil are extremely dry. The collection of plants, such as medicinal herbs, has also posed new problems (Yonzon 1993). In the mountain areas, where the growing season is very short and forest growth rates are extremely slow, the rate at which forest biomass is consumed is alarming.

The foregoing analysis indicates that firewood consumption will continue to grow in mountain areas of Nepal where tourism thrives. An increased population will increase firewood demand further. Since mountain tourism is expected to increase, and since not all tourists carry firewood substitutes, such as kerosene or cooking gas, the pressure on forests in such areas is bound to be compounded. Increased tourists also mean more porters, lodges, and tea



houses, which in turn mean greater demand for firewood-whether directly or indirectly-for cooking and heating.

Another important factor in firewood consumption is the price of firewood. The opportunity cost of firewood to local residents has increased as the time taken to collect firewood has increased compared to past years. This increase in the opportunity cost of time may be assumed to encourage more efficient use of firewood. In rural Nepal, this may not be true. The derived demand for firewood by lodge owners and households who entertain tourists and are willing to pay cash for firewood may have been strong enough to encourage more firewood collection despite increased collection time. Also, the government's effort to introduce new woodburning stoves that use firewood more efficiently may not have gained acceptance by many households, as indicated by Ives and Messerli (1989). Thus, tree replanting for purposes of sale is not likely to be encouraged in such a situation, despite evidence of greater scarcity (as reflected in the increased price of firewood) (Friend 1993; NTDP-Interim Report 1989).

The pattern of firewood consumption may have changed in current years, especially due to the ban on firewood consumption by trekkers. However, FITs continue to depend on local resources for food and accommodation and the demand for firewood by lodges, hotels, tea houses, and private homes cannot be assumed to have decreased.

### *Sociocultural*

The impact of tourism on local cultural traditions and values is difficult to assess. Not only tourists but also local people who travel for education, trade, or other purposes bring in new ideas and behaviour that affect cultural practices. Changes in people's behaviour, dress, lifestyle, family and social structure, and values and expectations; the decline in local support for local traditions and institutions; people's preference for tourist-related jobs over education; pollution of sacred places; and changes in traditional architecture are generally cited as instances of tourism's negative impact on culture. Economic impacts are also important in bringing cultural changes. It is difficult to assess whether such impacts are caused by tourism, economic factors, or by other factors. There are undoubtedly both positive as well as negative impacts of tourism on the sociocultural practices of mountain people (Haimendorf 1984; Upadhyay 1984; Robinson 1993; Lama and Sherpa 1994; Stevens et al. 1993b; Chhetri et al. 1992).

With the increase of tourism in the mountain areas, adult members often leave home for prolonged periods, which is believed to have affected *Sherpa* society, causing family break-ups in some cases.

It is said that the *Sherpa* have become overly westernised, that their religious faith has diminished. It is argued that most families prefer their children to undergo the new system of education rather than to join the monastery as monks.

Sharma's (1995) views are cited below:

*It (tourism) has led the traditional Buddhist highlander society to transform from a pastoralist-cum-subsistence agriculturalist, trading in Tibetan salt, wool, and grain across the high passes of the Himalayas between Tibet and Nepal to supplement their income from agriculture, into a life of modern-looking, western-dressed, English-speaking, widely-travelled, intelligent, endowed with a highly-developed skill in the tricks not only of mountain climbing, but also in running tour and trekking business [sic], in just a matter of three decades.*

Although not everyone believes the impacts on the *Sherpa* culture have been all positive, it could be argued that tourism has in general had more positive than negative effects on the *Sherpa* culture. The changes that have occurred far from being devastating seem to be closer to the normal process of change, and this change has been welcomed by the *Sherpa* themselves (Sharma 1994; Robinson 1993).

### *Employment<sup>2</sup>*

The impact of mountain tourism on employment can be assessed by estimating the number of temporary or permanent jobs created. However, this study will not estimate the permanent jobs created since its interest is only in assessing the employment generation in mountain areas where jobs generated by tourism are generally seasonal in nature. In mountain areas, tourism generates jobs for porters, cooks, kitchen boys, and guides, i.e., support staff. However, not all of these employment benefits accrue to the local population; quite often, people outside the area exploit this opportunity.

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2 This section and the following section on income is from Banskota and Upadhyay (1991b).

The common practice is to hire porters either in Kathmandu or at some point along the trek route (Banskota and Upadhyay 1989). Since group treks are generally organised by trekking agencies, the hiring of porters and other support staff is generally conducted in Kathmandu by the *sirdar* (Banskota and Upadhyay 1991b). If supplies are transported from Kathmandu by bus or plane to locations such as Jiri, Pokhara, or Hile, then porters are hired at these destinations.

Groups and individual trekkers hire different numbers of support staff. Based on interviews with trekking agencies and past studies, an average group size (group tourists) ranges from six to ten trekkers, and the average number of support staff hired ranges from about two to four per trekker (Banskota and Upadhyay 1991b; Upadhyay 1984; Baumgartner 1978). Using two support staff per trekker as a low estimate, and four support staff per trekker as a high estimate of the direct employment generated by group trekkers, an estimate of the overall employment impact can be reached if the numbers of trekkers in such groups are known. On the other hand, FITs hire between 0.5 to 1.5 per trekker<sup>3</sup>. Clearly, in terms of direct employment generation, group trekkers have a greater impact on employment than FITs.

Individual trekkers, however, generate other forms of employment. Since a large number of them depend on local lodges and hotels for food and accommodation, they generate employment in these facilities. Moreover, these facilities are generally owned by local people and hence employment is directly generated in the local area. In Sagarmatha and Langtang National Parks and the Annapurna Conservation Area, a large number of such lodges and hotels and tea stalls that cater to tourists would be out of business if individual trekkers did not visit or were not permitted to visit such areas. The trail to Sagarmatha National Park, starting from Jiri, is lined with lodges, hotels, and tea stalls, outlets that generate considerable employment. Nevertheless the employment generated by tourism in mountain areas is seasonal, generally lasting six to seven months in a year.

The average length of time staff members are employed by trekkers has been estimated to be about ten days, both for group and individual trekkers (Banskota and Upadhyay 1989, 1991b; ERL 1989). This average can vary substantially with different trekkers and the trekking routes they choose. Sharma (1989) reports an average length of stay of 25.8 nights for trekkers, which also includes the time spent in Kathmandu.

For the purpose of this study, an average of ten nights is assumed to be the length of stay of trekkers in mountain areas. The number of days of employment generated, however, varies depending on location and mode of transport. But assuming ten days to be the average, one group trekker annually generates roughly twenty to forty man days of employment, while one individual trekker generates roughly five to fifteen man days of employment. Table 4.10 provides an estimate of the total direct employment generated by mountain tourism over a period of years based on the above method and assumptions. Note that employment generated in lodges, tea houses, and hotels and other forms of indirect employment are not considered in Table 4.10. Clearly, the employment impact of mountain tourism is substantial. Furthermore, if employment generated by mountaineering teams is considered, the impact is greater than that reported in Table 4.10. Table 4.11 reports employment generated by mountaineering teams in Nepal over a period of time.

Direct employment generated by mountaineering expedition shows a declining trend, especially during the period 1990-1992. Direct employment generated by mountaineering teams declined from 9,154 persons in 1990 to 8,251 persons in 1992 because of lesser mountaineering teams and lesser members per team.

#### *Employment in Accommodation and Catering Services in Mountain Areas*

A recently conducted study by CEDA (1991) provides information on the employment related to the accommodation and catering industry that is connected to tourism in the whole of Nepal. Altogether 32 districts in the country were surveyed, with special surveys conducted in Kathmandu, Pokhara, and Chitwan. Selected results from this study are provided here to highlight the structure of manpower and its magnitude in the case of mountain tourism. It should be noted that all the accommodation and catering facilities in the mountain areas may not fully service tourists. Many may provide services to local people (i.e., local tourists) as well. But an estimate of the overall situation will indicate the significance of this sector in the mountain areas.

There were an estimated 24,524 people working in the accommodation and catering (restaurants) sectors during the time the survey was conducted in 1991. Out of this, 75 per cent were employed by the accommodation establishments (hotels of all kinds, lodges, etc), with the remaining employed in the catering industry. Males outnumbered females in the accommodation industry (79%), and in the catering industry female employment was even



lower (12.5%). More than 70 per cent of those employed were below 35 years of age, suggesting a limited opportunity for replacement employment.

The education status of those employed indicated that about 20 per cent in the entire industry had no formal education and only six percent had a university degree. Also, less than eight per cent had received any form of vocational training - three per cent in restaurants and eight per cent in accommodation (Table 4.12).

The recruitment method is mostly through personal contacts rather than through recruitment media. The overwhelming majority (85%) of the establishments indicated there was no problem in recruitment, except in the case of kitchen-related manpower. About 30 per cent of the establishments indicated that there was no need for training of any kind, reflecting the high number of small and family-operated establishments. The greatest need for training was reported in the area of kitchen services. The total number of beds estimated in all classes of establishment was 44,000, the number of seats in restaurants was estimated to be 25,000. The average ratio of persons to beds was 0.41 and to seats 0.26.

Table 4.13 presents some results on the accommodation and restaurants found in the mountain districts. Not all of these districts are popular for tourism but they have visitors, not all of whom are foreigners. Of the establishments in the country as a whole, 46 per cent are located in the hills and mountains, the majority in Kathmandu, Pokhara, and Chitwan. These latter three areas cater to the largest volume of tourists and are not included separately in the table. Thirty per cent of the establishments are located in Solukhumbu district, which contains the Sagarmatha National Park. Considering the broader Sagarmatha region, and including Ramechhap and Dolakha districts, the total for this region is 347 establishments (38%). These latter two districts lie on the Sagarmatha trekking route. Districts such as Kaski (Pokhara not included), Myagdi, Manang, and Mustang, which are all in the Annapurna region, contain 345 accommodation establishments, i.e., 38 per cent of the total in the mountain regions. In the Langtang region (Rasuwa and Nuwakot districts), there are 77 (8%) such establishments. The three protected area regions of Sagarmatha, Annapurna, and Langtang are the most popular tourism areas in the mountains and together account for 85 per cent of the accommodation facilities in the mountain districts. As a percentage of the overall establishments, these three regions account for 39 per cent of the establishments in Nepal, which is a very high percentage.

The employment of males and females in the accommodation establishments also presents an interesting picture. The total employment in the establishments of the mountain areas accounts for 18 per cent of the national total. If the mountain region alone is taken into account, the three regions mentioned above account for 77 per cent of the total employment in the accommodation industry. Males alone account for 34 per cent of the total employment, females for 42 per cent. It is interesting to note that in the Sagarmatha and Annapurna regions, female employment in the accommodation industry is much higher than male employment. The employment in restaurants is also presented in Table 4.13. In the catering industry in the mountain region, employment accounts for a much smaller percentage, although here too females outnumber males. It appears that the mountain tourism industry is more female labour-intensive than male with respect to accommodation and catering facilities. It has also induced the involvement of women in activities such as gathering and collecting fuelwood, cooking, and the day-to-day running of lodges. In areas experiencing seasonal migration for portering, the household burden and family responsibilities on women have increased (Bjonness 1980; Sharma 1989).

### *Income*

The impact of mountain tourism on income generation can also be estimated from secondary sources. First, the weighted average wage rate paid to different support staff members (*sirdar*, guides, cooks, kitchen boys, and porters) must be calculated. The weights used are the percentage of each type of support staff per group trekker (Table 4.14). The weighted average wage rate works out to Rs 66.82 per support staff member per day. Note that other benefits received by selected staff members like the *sirdar*, cook, kitchen boy, or guide in terms of food, clothing, and tips are not considered. Using the weighted average wage rate of Rs 67 (66.82) per support staff member, the income generation impact of mountain tourism employment for 1988 is presented in Table 4.15.

According to the figures presented in Table 4.15, the effect of mountain tourism on income is significant. Group tourists have a greater impact on income as they generally hire larger numbers of support staff. The effect of mountain tourism on income, however, does not end here. Individual tourists pay for local accommodation and food, an expenditure not accounted for. In addition, both group and individual tourists spend on drinks, fruit, handicrafts, and other items (Sharma 1989: Table 3). However, the generation of income through employment is the most substantial effect of trekkers as far as income

generation in mountain areas goes. Income generated by mountaineering tourism is also substantial and competes fairly closely with that generated by trekking tourism (Table 4.16). Income generated by mountaineering teams in Nepal generally shows a steeply increasing trend. Between the period from 1980 to 1992, the average annual growth rate in income is 17 per cent. In addition, mountaineering also generates substantial revenues in the form of royalties, which, however, remain with the government. Also, in many cases, all the income that accrues to mountain tourism is not retained in the areas where mountain tourism occurs. Lodge owners who benefit most are from regions outside the trekking area, and the largest income from agency-organised trekking goes to people living far from the area (Sharma 1989). Additionally, many from one region travel as porters to other regions so that local income impacts tend to be minimal.

Trekkers could have a greater impact on income in mountain areas. At present, group trekkers and mountaineers purchase most of their food items in Kathmandu prior to treks or expeditions in addition to what they import. Many of these items - including vegetables, eggs, milk, and other perishable foods - could be produced locally. Encouraging the production of these items where tourism is active would benefit these areas even more than indicated above.

### *Impact on Women*

Tourism is believed to have had both positive and negative impacts on women in the mountain areas. Although no studies have so far directly addressed this issue, evidence can be pooled together to shed some light on the impact of tourism on women.

One impact has been the increasing burden on women to look after the family and agriculture as adult family members stay away from home for prolonged periods to serve tourists. Although not reported, this negative impact could have resulted in a smaller family size, which has ramifications on women's health and time allocation and can be seen as an indirect positive impact induced by tourism.

In rural areas of the mountains, literacy rates among women are relatively lower than those of males and opportunities for gainful off-farm employment-except as porters-is seldom available to women. However, with the advent of tourism in these remote and inaccessible areas, a large number of women have been able to find self-employment in running lodges and tea houses. Many women from the mountain communities not only manage lodges in the mountain areas

but also in Kathmandu. Not only has tourism been able to provide off-farm employment to women, but it has also provided women with the opportunity to demonstrate their capabilities as good managers.

Tourism has also helped women to undertake such highly specialised and skilful activities as climbing Mt. Everest, which undoubtedly has increased their morale. Women from the *Sherpa* community have been trained as doctors and increasing numbers of females from such communities are going for higher education. Perhaps the full impact of tourism on women is just beginning to unfold; in a few decades, the impact will be visible.

Although there is no evidence to point to the other impacts of tourism on women, it may be conjectured that other positive impacts, such as on household decision-making, may have increased since more and more women have begun to participate in tourism.

### *Other Impacts*

Although not directly attributable to tourism, there are other impacts that can be identified. The discussion below conjectures and aims to shed light on new tourism impacts. These other impacts, resulting from mountain tourism, can be broadly grouped as a) poverty alleviation; b) awareness generation (education, health and hygiene, conservation of natural and cultural sites, etc); c) development (infrastructure, settlement, cottage industry, etc); d) socio-demographic; e) research; and f) publicity for Nepal.

There is no doubt tourism has been able to alleviate poverty in many areas. This is obvious if one simply compares similar areas in the mountains where tourism is occurring and where tourism does not exist or is of small magnitude. The above sections have highlighted the employment and income impacts of tourism. It should be realised that in areas where there is no tourism, such impacts simply do not exist. Although nothing can be said of the magnitude of the impact of tourism on poverty alleviation in areas where it flourishes, i.e., the income distribution aspects of tourism, the relative impacts of tourism in a 'with' and 'without' situation are incomparable.

Awareness generation in various dimensions of life among the local people of different mountain regions can be attributed to the impact of tourism. It is beyond the scope of this study to address the various dimensions of awareness generation or changes that can be attributable to tourism. Nevertheless, some important ones can be identified. Compared to other mountain regions of Nepal,



the level of literacy among the younger generation of the *Sherpa* people of Khumbu is relatively high. Some basic understanding of a second language (mostly English) among local people where tourism is practised (Sagarmatha, Annapurna, and Langtang), relative to other similar mountain people in areas where there is no tourism, is another case in point. Among the people of these regions, the awareness about health and hygiene is of a higher standard than in other mountain pockets not frequented by tourists (Industrial Services' Centre [ISC] 1979). Sometimes these types of impacts can be negative, as in the case of Ghorepani and Rolwaling where the sale of vegetables, eggs, fruit, and milk to trekkers has reduced the supply of important nutrients to the local people. This has had a negative impact on nutrition (Baumgartner et al. 1978; Joiner 1986/87).

The relatively greater awareness about conservation of cultural sites and nature may also be different among two groups of mountain people. Chettri (1993) has reported the loss in cultural assets (theft) of local communities in the Jomsom-Marpha area because of sale to tourists. On the other hand, tourism has helped preserve local monuments, as in the case of the Tengboche Monastery and others.

Infrastructural development in remote areas of the mountains can also be attributed to the growth of tourism. Had there been no tourism in these areas, it is most likely that airstrips, bridges, and trails would not have been developed so early. The limited resources of the government and local people would perhaps not have been adequate to build all the infrastructures available in areas such as SNP, ACAP, and LNP, had there been no tourism. Other types of infrastructural development such as transport, communication, mini-hydropower, water supply, and extension services can also be indirectly attributable to tourism. This becomes fairly obvious if one compares the conditions of infrastructure in popular tourism places such as the Khumbu and Annapurna with those in the Makalu, Manaslu, or Kanchenjunga regions. Furthermore, there has also been growth in market towns due to tourism in mountain areas. Various places en route to Sagarmatha, in the Annapurna region, and other regions have experienced the development of growth points or growth axes or even market towns. Local people have benefitted by such development as services have come closer to their doors. An extreme example of this development is the case of Pokhara, which has experienced remarkable growth. Other settlement areas that have experienced growth and modernisation in terms of their size and functions are Namche Bazaar, Lukla, Junbesi, Jiri, Ghorepani, Ghandruk, Tatopani, and Dunche. In this context it is also worth noting that awareness and development are related, e.g., better

hygiene, a better living environment, and improved health facilities required to cater to tourists have also benefitted local people. Furthermore, other spontaneous development activities have occurred due to tourism - as in the case of Marpha village in the Annapurna region where tourism has generated off-farm activities, which otherwise would not have come about (Chhetri et al. 1992).

The growth of tourism in mountain areas has also had socio-demographic effects. Tourism is often believed to reduce the outmigration process. Available evidence from Nepal in this regard are, however, mixed and location-specific. In the Khumbu region, the growth of tourism reduced the temporary migration of *Sherpa* people to Darjeeling in search of employment. Income accruing from tourism has at the same time encouraged migration. For example, there has been a steady flow of younger men aspiring to be tourist guides (ISC 1979). Anecdotal evidence from Jomsom-Marpha reveals that some entrepreneurs who had migrated in the past are now returning because of the growth in tourism (Chhetri et al. 1992). It is also reported that men in search of better income and employment opportunities abandon their homes and leave the women behind to look after all household activities, including farming. As a result, there has been a decrease in the supply of agricultural labour in households, with the women left in charge unable to continue traditional land-use practices (Friend 1983). Had returns from traditional occupation been rewarding enough, such seasonal migration would perhaps not have arisen. This pattern of seasonal migration is generally true in many mountain areas of Nepal where economic hardships are increasing (Sharma 1988).

The effect of tourism on population growth in mountain areas is not clear. In the Rolwaling Valley, tourism-induced population growth (Baumgartner et al. 1978). Family planning practices are common and the fertility rate of the *Sherpa* is found to have declined (Fisher 1986). Other positive impacts on life are reported in consumption habits, schooling, and general health and nutrition.

The area of research in Nepal is another important area that can be said to have benefitted from tourism. There are a multitude of studies that span different areas, such as anthropology, biodiversity, culture, glaciers, etc, that have benefitted from tourism. In many cases, tourists have either been directly involved in carrying out such studies or have funded or found financial support for Nepalese as well as foreign scholars interested in carrying out such studies.

Finally, Nepal has received a great deal of international publicity through tourism, especially mountain tourism. There is no doubt some of this publicity

has been negative. By and large, the publicity has helped Nepal promote itself as a unique country for tourism. The vast number of books that have been printed, the many hours of documentary films that have been made, the many articles published by scholars in international journals, the nearly half dozen or so cover stories published in the National Geographic magazine, and the millions of photographs that circulate the globe have largely been the result of tourism.

## **Issues**

### *Limited Carrying Capacity and Mountain Resource Management*

Mountain and trekking tourism have played a significant role in transforming rural communities in certain areas of the mountain regions, notably the Sagarmatha, Annapurna, and Langtang regions, by diversifying the local economies from a below subsistence farming and herding system to a tourism-based economy within the last twenty years or so. However, these areas are composed of sensitive micro-ecosystems with meagre tolerance to stress and limited carrying capacity. Aggressive tourism activities in such areas without proper mountain resource management has created serious environmental threats. As a result, such areas are believed to be already carrying tourists beyond their sustainable limits. There are reasons to believe that the tourism carrying capacities of such areas are already exceeding their limits not only from an environmental point of view but in terms of the infrastructure available. In other words, "the goose that lays the golden egg is not being well attended to," and current practices are not encouraging enough to sustain the goose's health. Clearly promoting mountain and trekking tourism without consideration of the area's specific carrying capacity under the given state of technology, infrastructure, and policy environment is likely to make tourism unsustainable.

### *Code of Conduct*

Remedial actions and a code of conduct have been formulated, but the fact that negative impacts or excess stress on the carrying capacity continue to occur indicate that policies have failed or that their enforcement has been ineffective. Furthermore, in some areas in the mountains visited by tourists, tourism management just does not exist, thereby affecting negatively the carrying capacity of such areas.



In the more popular areas where trekking and mountaineering activities are conducted, such as the Sagarmatha National Park, Langtang National Park, and the Annapurna Conservation Area, the existing management systems have been able to curb the negative impacts and promote the positive impacts. In terms of the rules and regulations minimising negative impacts and promoting the comparative advantage of the area, as well as being sensitive to the needs of the local people, the effectiveness of the management regimes found in these areas varies. Clearly, the policy framework governing such areas needs to be assessed to evaluate its effectiveness in environmental conservation and its promoting income and employment in the local areas.

### *Investments*

In protected areas where tourism is popular, the different management modalities that exist limit the scope of private investment from people outside the community. Such investments are prohibited, justifiably so on the grounds that local people would face unnecessary competition from outside, would not be able to compete, and thus stand to lose their current businesses. Although the validity of this kind of argument has never been well studied, the argument may have some truth. It is, however, worth examining the investments that cater to tourism made by these local people in their areas in order to understand the difficulties such investors are facing under the current policies. Ways can perhaps be found to improve the policy environment that promotes the environment, local businesses, and tourism-related services, i.e., the carrying capacity.

### *Diversification*

It is necessary to diversify tourism to new areas to ensure environmental conservation. This strategy will promote more income, employment, and a better distribution of income. The development of new areas will, however, depend primarily on the strength of the forces that operate on the supply side, although the demand side will also be important. Unique characteristics of the area have to be identified, and innovative strategies need to be promoted. With the old trekking areas already overcrowded, there is a growing need to diversify tourists to newer areas.



### *Inadequate Research*

To date, there has been no one complete study conducted in any area that incorporates tourism as an integral part of mountain development, although scattered studies that deal with different issues conducted at different time intervals exist. As a result, it has been difficult to systematically assess the impacts of tourism in mountain areas. Such studies need to be conducted at specific time intervals to understand, among other things, the linkages of mountain tourism with the mountain economy.

Given the need for integrating trekking and mountain tourism with local environment and development, it is equally important to address the gender issue with emphasis on the female role. Women are the backbone of the rural areas and are known to be effective in natural resource management. They are also actively involved in agriculture and animal husbandry. Therefore, linking tourism development with local community development requires the active participation of women. It is essential to explore how women can be involved in integrating tourism with local community development.

Integrating tourism and local community development will require institutional development at the local grassroot's level. Presently, such institutions at the local level do not exist (see Chapter 5). The role of such institutions and the ways and means to make such institutions viable and sustainable have to be explored.

Although tourism benefitted research, such research has been carried out only in the self-interest of scholars. A well-planned research agenda to address the different problems of mountain areas and mountain tourism is still missing. The first example that can be cited of preliminary work conducted in this manner is the case of the Makalu-Barun National Park and Conservation Area (Shrestha et al. 1990).

**Table 4.1: Per Hectare Yield and Benefit (Gross) of Different Land Use Practices in Rasuwa**

| Crops  | Mt/Ha | Rs/Ha  |
|--------|-------|--------|
| Apples | 7.66  | 74,600 |
| Pear   | 13.50 | 67,500 |
| Walnut | 2.75  | 68,750 |
| Paddy  | 1.98  | 7,086  |
| Maize  | 1.42  | 1,994  |

Source: For fruits see Shrestha (1989), and for paddy and maize see Banskota and Sharma (1993a)

**Table 4.2: Litter Deposits in the Mountain Environment, 1988 (in kg)**

| Area                            | Number Trekkers | Average Deposited | Total Deposited |
|---------------------------------|-----------------|-------------------|-----------------|
| Annapurna                       | 37902           | 15                | 56853           |
| Khumbu                          | 11366           | 15                | 17049           |
| Langtang                        | 8423            | 15                | 12635           |
| Other                           | 3582            | 15                | 5373            |
| Cumulative total (1976 to 1993) |                 | 640mt             |                 |

**Mountaineering (1979-1988): Garbage Cleared From Everest Base Camp, Spring 1993**

|                | Disposable Garbage | Non-Disposable Garbage | Oxygen/Gas Cylinders | Total    |
|----------------|--------------------|------------------------|----------------------|----------|
| 14 expeditions | 7030               | 2350                   | 3444                 | 12824    |
| Average/team   | 502                | 168                    | 246                  | 916      |
| Range          | 90-1350            | 60-360                 | 356-540              | 390-1820 |

Nepal Total (1979-1988) total for 840 teams:

|               |               |               |                 |
|---------------|---------------|---------------|-----------------|
| <b>421680</b> | <b>141120</b> | <b>206640</b> | <b>769.44mt</b> |
|---------------|---------------|---------------|-----------------|

Source: Lama and Sherpa (1994)

**Table 4.3: Trekkers Opinion on Sanitation and Garbage Disposal Facilities in LNP**

|                 | Sanitation Facilities |            | Garbage Facilities |            |
|-----------------|-----------------------|------------|--------------------|------------|
|                 | Adequate              | Inadequate | Adequate           | Inadequate |
| Lodge           | 26 (33)               | 53 (67)    | 47 (59)            | 33 (41)    |
| Camp Sites      | 17 (35)               | 31 (65)    | 31 (65)            | 29 (63)    |
| Private Homes   | 5 (24)                | 16 (76)    | 9 (39)             | 14 (61)    |
| Trekking routes | 25 (34)               | 49 (66)    | 16 (20)            | 62 (79)    |

Figures in parentheses are in percentages.

Source: Banskota and Upadhyay (1989)

**Table 4.4: Firewood Consumption by Tourists**

| Destination | Local Population | Annual Fuelwood Consumption (000kg) | % Increase of trekkers demand over local needs |
|-------------|------------------|-------------------------------------|--|
| Sagarmatha  | 3,000            | 1,968                               | 85.2   |
| Langtang    | 6,588            | 4,322                               | 18.0   |
| ACAP        | 7,000            | 4,592                               | 4.7  |

Source: ERL (1989); Annex C Table 1

**Table 4.5: Average Fuelwood Consumption Associated with Mountain Tourism (1987)**

| Type of Tourist     | Number of Tourists (kg) | Fuelwood Consumption (kg) | Total Consumption |
|---------------------|-------------------------|---------------------------|-------------------|
| Mountaineers        | 796                     | 18.5                      | 927,700           |
| Group Trekkers      | 21,805                  | 18.6                      | 4,062             |
| Individual Trekkers | 25,470                  | 5.5                       | 1,415             |
| Rafters             | 3,612                   | 4.5                       | 32,500            |

Source: ERL (1989) Annex C Table 1.1.3(b) and Attachment 1, Tables 2 and 3

**Table 4.6: Daily Firewood Consumption by Group Trekkers**

| Survey Area | Year | Kg/Person/day |
|-------------|------|---------------|
| Rolwaling   | 1978 | 2             |
| Everest     | 1980 | 4.5           |
| Everest     | 1984 | 8             |

Source: Rolwaling (1978), Everest (1980), and Everest (1984) estimates are respectively from Baumgartner et al. (1978); Bjønness (1980); and Upadhyay (1984)

**Table 4.7: Consumption of Fuel and Firewood in Sagarmatha National Park**

|   | Organized Groups | Individual Trekkers |
|---|------------------|---------------------|
| Number of trekkers                      | 338              | 145                 |
| Manpower assistance                     | 586              | 82                  |
| <b>Total consumers</b>                  | <b>924</b>       | <b>227</b>          |
| <b>Consumption pattern (in %)</b>       |                  |                     |
| Eating in lodges/tea houses, hotels     | -                | 73                  |
| Kept own kerosene                       | 7                | 18                  |
| Cooked in sherpa lodges                 | 2                | 4                   |
| Bought fuel/firewood from local dealers | 91               | 5                   |
| <b>Total</b>                            | <b>100</b>       | <b>100</b>          |

Source: Bjønness (1980)

**Table 4.8: Daily Firewood Consumption by Households and Lodges SNP**

| Type of Household (Source) | Year | Quantity Consumed (kg/per household/day) |
|----------------------------|------|--|
| <b>Everest:</b>            |      |  |
| Pure Households:           | 1984 | 18                                       |
| Upadhyay                   | 1988 | 3  |
| CEDA                       | 1980 | 14                                       |
| Bjønness                   |      |  |
| Household cum Lodge:       |      |  |
| Upadhyay                   | 1984 | 38                                       |
| CEDA                       | 1988 | 11                                       |



**Table 4.9: Estimate of Firewood Consumed by Tourists in Selected Protected Areas (mt)**

| Year        |       | 1976 | 1977 | 1980 | 1981 | 1982 | 1987 | 1988  |
|-------------|-------|------|------|------|------|------|------|-------|
| SNP:        | Group | 619  | 692  | 858  | 747  | 917  | 1323 | 1671  |
|             | FITS  | 165  | 184  | 229  | 199  | 245  | 353  | 446   |
| LNP:        | Group | 217  | 293  | 466  | 577  | 514  | 693  | 955   |
|             | FITS  | 27   | 36   | 58   | 71   | 63   | 85   | 118   |
| ACA:        | Group | 229  | 294  | 456  | 543  | 628  | 985  | 1204  |
|             | FITS  | 131  | 168  | 261  | 310  | 359  | 563  | 688   |
| Others:     | Group | 102  | 110  | 748  | 507  | 436  | 295  | 863   |
|             | FITS  | 9    | 9    | 62   | 42   | 36   | 25   | 72    |
| Total:      | Group | 1168 | 1390 | 2528 | 2374 | 2495 | 3295 | 4693  |
|             | FITS  | 331  | 398  | 610  | 623  | 703  | 1025 | 1324  |
| Total       |       | 1499 | 1788 | 3138 | 2997 | 3198 | 4321 | 6017  |
| Fresh total |       | 2497 | 2979 | 5228 | 4993 | 5329 | 7198 | 10024 |

Notes: The estimates have been derived based on the per capita consumption figures provided in ERL (1989). The estimates made by Gurung have also been used.

Source: ERL (1989); Gurung (1990)

**Table 4.10: Direct Man Days of Employment Generated by Mountain Tourism**

| Year | Group        |                                 | Individual   |                                 | Total Employment Generated (Man Days) |         |
|------|--------------|---------------------------------|--------------|---------------------------------|---------------------------------------|---------|
|      | Total number | Employment Generated (Man Days) | Total number | Employment Generated (Man Days) | High                                  | Low     |
|      |              | High Low                        |              | High Low                        |                                       |         |
| 1985 | 16,937       | 667,480 338,740                 | 11,770       | 176,550 58,850                  | 844,030                               | 397,590 |
| 1986 | 19,829       | 793,160 396,580                 | 13,780       | 206,700 68,900                  | 999,860                               | 465,480 |
| 1987 | 21,337       | 853,480 426,740                 | 14,827       | 222,405 74,135                  | 1075,885                              | 500,875 |
| 1988 | 22,873       | 914,920 457,460                 | 15,895       | 238,425 79,475                  | 1115,345                              | 536,935 |

Note: The figure for employment generated by group tourists is the average number of trekking days (10) multiplied by 2 (low) or 4 (high) support staff (including porters) multiplied by the number of trekkers. The figure for employment generated by the individual tourist is the average number of trekking days (10) multiplied by 0.5 (low), or 1.5 (high) support staff multiplied by the number of trekkers. The trekkers who reported trekking and mountaineering are split into group and individual trekkers using the 59 and 41 per cent formula. Mountaineering tourism generates more employment than either group or individual tourism (ERL 1989).

**Table 4.11: Employment Generated by Mountaineering Teams**

| Year | No. of Teams | No. of Mountaineers | Seasonal Employment |
|------|--------------|---------------------|---------------------|
| 1980 | 64           | 639                 | 9016                |
| 1985 | 91           | 824                 | 8835                |
| 1986 | 94           | 807                 | 10415               |
| 1987 | 98           | 796                 | 11166               |
| 1988 | 92           | 936                 | 10839               |
| 1989 | 125          | 1053                | 10984               |
| 1990 | 120          | 966                 | 12179               |
| 1991 | 130          | 1038                | 9154                |
| 1992 | 113          | 929                 | 8251                |

Source: Ministry of Finance, Economic Survey (1993)

**Table 4.12: Employment by Type of Establishment**

| Type          | Total Employed | Percent |        |
|---------------|----------------|---------|--------|
|               |                | Male    | Female |
| Accommodation | 18,072         | 79      | 21     |
| Restaurant    | 6,452          | 88      | 12     |
| Total         | 24,524         | 81      | 19     |

Source: CEDA (1991)

**Table 4.13 : Establishments in Selected Mountain Areas**

| District         | Number of Estab. | Accommodation |              |              | Employment in Restaurant |              |             | All Total    |
|------------------|------------------|---------------|--------------|--------------|--------------------------|--------------|-------------|--------------|
|                  |                  | M.            | F.           | Total        | M.                       | F.           | Total       |              |
| Dhankuta         | 38               | 108           | 58           | 166          | 1                        | 1            | 2           | 168          |
| Sankhuwasabha    | 12               | 31            | 10           | 41           | 10                       | 10           | 20          | 61           |
| Solukhumbu       | 271              | 391           | 486          | 877          | -                        | -            | 0           | 877          |
| Ramechhap        | 53               | 70            | 95           | 165          | -                        | -            | 0           | 165          |
| Dolakha          | 23               | 36            | 36           | 72           | 6                        | 1            | 7           | 79           |
| Makwanpur        | 9                | 41            | 6            | 47           | 17                       | 1            | 18          | 65           |
| Kabhre           | 14               | 154           | 27           | 181          | 29                       | 18           | 47          | 228          |
| Sindhupalchok    | 4                | 7             | 5            | 12           | 20                       | 10           | 30          | 42           |
| Nuwakot          | 11               | 19            | 19           | 38           | 4                        | 5            | 9           | 47           |
| Rasuwa           | 66               | 140           | 117          | 257          | 8                        | 3            | 11          | 268          |
| Palpa            | 21               | 56            | 27           | 83           | 68                       | 26           | 94          | 177          |
| Tanahu           | 4                | 13            | 7            | 20           | 35                       | 20           | 55          | 75           |
| Gorkha           | 41               | 144           | 83           | 227          | 14                       | 8            | 22          | 249          |
| Kaski            | 118              | 155           | 228          | 383          | 15                       | 31           | 46          | 429          |
| Myagdi           | 71               | 109           | 164          | 273          | 7                        | 22           | 29          | 302          |
| Manang           | 83               | 118           | 148          | 266          | -                        | -            | 0           | 266          |
| Mustang          | 73               | 103           | 130          | 233          | 11                       | 14           | 25          | 258          |
| <b>Total</b>     | <b>912</b>       | <b>1695</b>   | <b>1646</b>  | <b>3341</b>  | <b>245</b>               | <b>170</b>   | <b>415</b>  | <b>3756</b>  |
| <b>Mountains</b> | <b>45.97</b>     | <b>11.87</b>  | <b>43.37</b> | <b>18.49</b> | <b>4.34</b>              | <b>21.07</b> | <b>6.43</b> | <b>15.32</b> |
| <b>Nepal</b>     | <b>1984</b>      | <b>14277</b>  | <b>3795</b>  | <b>18072</b> | <b>5645</b>              | <b>807</b>   | <b>6452</b> | <b>24524</b> |

Source: CEDA (1991)

**Table 4.14: Support Staff Hired by Group Tourists and Wage Calculations**

| Support Staff | Number (Rs/day) | Weights | Mean Wage |
|---------------|-----------------|---------|-----------|
| Sirdar        | 1.0             | 0.14    | 77        |
| Cook          | 1.0             | 0.14    | 70        |
| Guide         | 2.5             | 0.26    | 58        |
| Kitchen Boy   | 3.1             | 0.32    | 58        |
| Porter        | 2.0             | 0.21    | 60        |
| Average Wage  | 9.6             | 1.00    | 67        |

Source: The number of support staff for an average group of ten is obtained from Banskota and Upadhyay (1991a), who also provided the mean wage rates.

**Table 4.15: Income and Employment Generated by Group and Individual Tourists: 1988**

| Type of Tourist     | Employment (mandays) | Income (Rs) |
|---------------------|----------------------|-------------|
| Group Tourists      |                      |             |
| High                | 914,920              | 61,299,640  |
| Low                 | 457,460              | 30,649,820  |
| Individual Tourists |                      |             |
| High                | 238,425              | 15,974,475  |
| Low                 | 79,475               | 5,324,825   |
| All Tourists        |                      |             |
| High                | 1,153,345            | 77,274,115  |
| Low                 | 536,935              | 35,974,645  |

Notes: The high and low income estimates provided in the above table are multiplied by the average weighted wage rate of Rs. 67 per day.

**Table 4.16: Income Generated by Mountaineering Teams**

| Year | No. Teams Mountain. | No. (Rs'000') | Income (Rs '000') | Royalty |
|------|---------------------|---------------|-------------------|---------|
| 1980 | 64                  | 639           | 15,827            | 843     |
| 1985 | 91                  | 824           | 17,871            | 3,298   |
| 1986 | 94                  | 807           | 28,854            | 4,063   |
| 1987 | 98                  | 796           | 34,020            | 4,330   |
| 1988 | 92                  | 936           | 42,583            | 5,079   |
| 1989 | 125                 | 1,053         | 63,976            | 7,222   |
| 1990 | 120                 | 966           | 68,368            | 7,266   |
| 1991 | 130                 | 1,038         | 156,363           | 8,929   |
| 1992 | 113                 | 929           | 101,355           | 30,351  |

Source: Ministry of Finance, Economic Survey (1993)