

Environmental and socio-cultural impacts of river rafting and camping on Ganga in Uttarakhand Himalaya

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The most outstanding feature of the River Ganga is that it offers uncommon environmental diversity, impressive scenery, and an outstanding adventurous and wilderness experience. All these attributes contribute towards wild land-based recreation. The objective of this article is to assess the environmental and socio-cultural impacts of camping and white-water rafting on this river. This article has largely relied on primary survey and secondary data collected from different government departments. In all instances, both primary and secondary data sources were used in various analyses. However, much of the article is based on the results of a social survey carried out between January 2006 and June 2007. Findings indicate some of the major environmental impacts of tourism, and its positive and negative socio-cultural impacts. Some of the positive socio-cultural impacts include income generation and employment opportunities from both camping and rafting to the local people, infrastructure development such as hotels, lodges and camps, and the improvement of social services such as communication, supply systems and telecommunications. The negative socio-cultural impacts include increased out-migration, frustration among the youth, and cultural degeneration. This article argues that tourism needs to be sensitive to local environmental and cultural norms and beliefs for it to be accepted by local people and promote sustainable development. If the norms as laid down by the government are followed by the operators, it can minimize the negative environmental and cultural impacts of this activity.

Keywords: Camping, environmental and social impact assessment, river rafting, tourism.

MOUNTAINS and rivers are the foundation for tourism, and the environmental resources (e.g. species habitat for ecotourism, snow cover for skiing, water supply, etc.) have a strong influence on the length and quality of tourism and recreation. Tourism has been one of the global economic success stories in the last 40 years¹. It is arguably the world's largest industry, accounting for about 5.5% of the world's Gross National Product (GNP) and 6% of the employment, and it is also growing fast². River-side camping, whitewater rafting and kayaking on River Ganga are fast becoming one of the most popular new 'adventure sports', with images of kayaking and rafting used in advertising for everything from toothpaste to computers. As the popularity of whitewater rafting and kayaking continues to increase, and with the heavy influx of youngsters and sports and adventure-loving persons, environmentalists, planners and activists expect to see severe environmental and

social impacts in the surrounding regions due to this activity. To the best of our knowledge, no prospective studies of whitewater rafting and camping have been performed for the River Ganga so far, to assess the rates of gradual change or to show the impact on the immediate environment in and around the camping and sports sites. However, there have been a number of websites, advertisements, hoardings and short documentary films to attract holiday seekers, sport lovers, clients and service providers to develop an understanding of some of the thrills and adventures involved in such activities.

As with any type of economic development, tourism creates changes that threaten the quality of life. Changes in the host community's quality of life are influenced by two major factors: the tourist–host relationship and the development of the industry itself³. Social and cultural changes to host societies include changes in value systems, traditional lifestyles, family relationships, individual behaviour or community structure. In the absence of any such previous studies on river rafting and camping in the Himalayan region, there are no data to compare or analyse our recent findings. The general notion of tourism

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is that it promotes economic activity, boosts the local production of resources and helps in infrastructure development without paying attention to the negative socio-cultural impacts. Due to the sanctity of River Ganga, there is need to assess the impact of river rafting and camping on the quality of its waters. Because of this, the rapid growth of rafting and camping on the Ganga in the Himalaya raises questions of sustainability. Using the concept of sustainable development, the objective of this article, therefore, is to assess the socio-cultural impacts of whitewater rafting and camping in the Himalaya. Due to the lack of quantitative data to support our recent findings, our understanding of the potentially profound ecological, social and cultural impacts of adventure sports on the immediate surrounding remains equally limited. Despite the growing significance of river rafting to the Uttarakhand economy and the obvious interrelationship with its immediate environment, a number of researchers have lamented that the deteriorating forests and quality of water have not been adequately assessed. The aim of this article is to ascertain the level of existing public use associated with River Ganga from Byasi in the mountains to Rishikesh in the plains and study the environmental, social and cultural impacts of river rafting, kayaking and camping on the surrounding forest, river bank, water, village land-use, and social and cultural changes in the traditional Himalayan society.

Study area

The study area is located in the Garhwal region, Uttarakhand, between $30^{\circ}4'27''\text{N}$ – $30^{\circ}7'23''\text{N}$ and $78^{\circ}29'59''\text{E}$ – $78^{\circ}18'51''\text{E}$ (Figure 1). This study was carried out between Kaudiyala and Rishikesh along the Badrinath National Highway surrounded by broadleaf forest type, and covers a road distance of 40 km and river distance of 36 km. The region is influenced by the southwest monsoon in summer.

Methods

Information regarding the number and area of the camping sites was collected from the Office of the Divisional Forest Officer, Munikireeti, Directorate of Tourism, Government of Uttarakhand and a primary survey was conducted along the stretch between Kaudiyala and Rishikesh. Several visits were made to decide the timing of the social survey, so that both the peak and lean periods were covered. In order to understand the perception of local people about positive and negative impacts of river rafting and camping, and spotting of wildlife in their surroundings, the elderly men and women of ten villages located near the camping and rafting sites were queried. The primary survey was conducted using a questionnaire, followed by informal and formal meetings and group discussions with

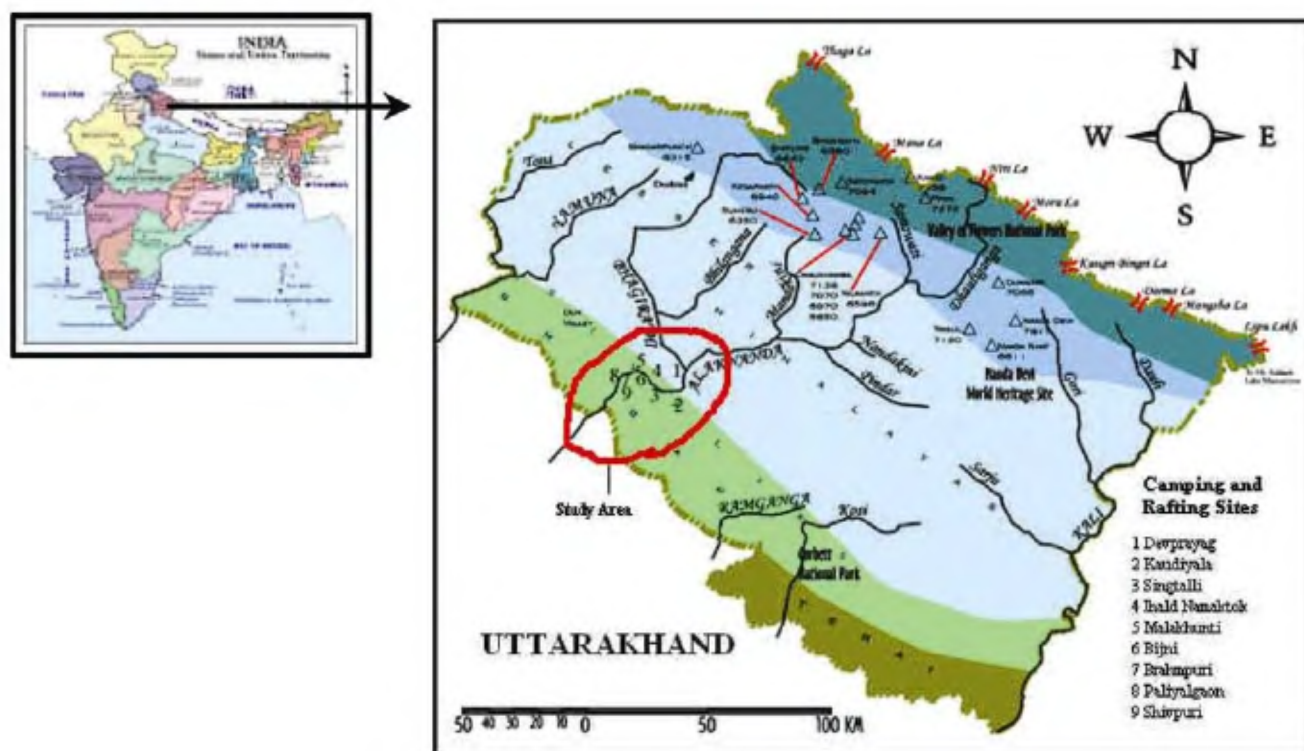


Figure 1. Map of the study area.

the stakeholders and villagers. The data thus generated were cross-checked with the target groups and each set of information was verified in numerous meetings and group discussions. In order to assess the opinion of the local community regarding the camping and rafting activities, four rounds of formal and informal meetings were held with the villagers after the questionnaire-based survey, regarding the spotting of wild animals and the perceptions of the villagers. Since the camping and rafting activities are open between September and June, and the rush of tourists is high between April and June, especially on weekends and holidays, the survey was conducted during the peak tourist period and also during the lean period.

Growth of camping and rafting on the Ganga

Prior to 1996, there were just two river camping sites in the area, one was at Kaudiyala–Shivpuri and the other at Byasi (35 km upstream from Rishikesh), and were solely owned by the Garhwal Mandal Vikas Nigam (GMVN), Government of Uttar Pradesh. Similarly, there were just two private river camping sites, one at Brahmpuri and the other at Shivpuri in 1994. River rafting and camping along the Ganga between Byasi and Shivpuri in Uttarakhand is only about 15 years old, and the mushrooming

of new camping sites is a recent phenomenon. In 1997, there were only eight camping sites scattered at four locations, while in 2006 there were 45 camping and rafting operators (Figure 2). Among them, 25 had both camping and rafting facilities, and 20 operators have just rafting facilities. The camp operators are spread over in ten locations, with maximum number at Singtalli followed by Shivpuri. The total area allotted for camping sites on the Ganga bed is 183,510 sq. m, and the camp-wise details of area allotted to different camp operators are presented in (Table 1). Five camps have the largest accommodation facilities for participants, i.e. between 30 and 35, and seven camps have facilities for 20–30 and the rest have facilities for more than 15 participants. The average number of toilet tents ranged from 4 to 10 per camp for the guests; there was also a separate kitchen and dining hall in each camp. Rafting participants far outnumber kayakers and campers, largely because commercial rafting trips are conducted no more than once or twice a year. Compared to camping, river rafting is more challenging and cheaper. The rates for rafting have been fixed by the Government of Uttarakhand, and duly accepted by the raft operators. The average rate for one person on a single stretch of 12–15 km is Rs 500.

There are around 40–45 villages within less than 500 m from the River Ganga between Kaudiyala and Shivpuri

Table 1. Area allotted to camping sites and number of available toilets on the Ganga beach in 2005–06

Location	Camp and raft operators	Area allotted (sq. m)	Toilet tents	Mean no. of toilets ± 0.707106781 (n = 2)
Shivpuri	Snow Leopard Adventures	11,600	9–10	9.5
	Himalaya River Runners	24,000	4–5	4.5
	Wanderlust Travelers	4400	4–5	4.5
	Great Indian Outdoor	9200	6–7	6.5
Singtalli	Aqua Terra Adventures	12,800	4–5	4.5
	Outdoor Adventures	12,000	9–10	9.5
	River Wilds	10,800	7–8	7.5
	Alaknanda River Adventures	4500	4–5	4.5
	Questrails Adventure	4400	5–6	5.6
	Logout @ Work	3900	5–6	5.6
	Adven Tours	4500	4–5	4.5
	Camp David Adventures	10,400	8–9	8.5
Brahmpuri	J2 Adventure	3900	5–6	5.6
	Dream Life Adventure	2750	4–5	4.5
	Ganga River Tour	2200	4–5	4.5
	Great Himalaya Expeditions	8000	6–7	6.5
Bijni	Glacier Tour	2300	4–5	4.5
	Explore Himalaya Adventure	5980	8–9	8.5
Malakhunti	Splash Adventure	4180	5–6	5.5
	Garhwal Himalaya Explorations	3000	4–6	4.5
Paliyalgaon	Mercury Himalaya	6800	5–6	5.5
Kaudiyala	Rimo Expeditions	10,800	6–7	6.5
Jhald Namaktok	Adventure Links	8500	6–7	6.5
Private Land	VNA Hotels P. Ltd	9200	7–8	7.5
Neerghar	Venture Himalayas	3400	4–5	4.5

Source: Primary Survey and Office of DFO, Munikireeti, Uttarakhand, 2006; ± Standard deviation.

where all the camping sites are located. Few of the local people inspired by the tourism prospects in the region have built permanent camp sites at Shivpuri and Mala villages on private land. Some villagers have also sold their private land situated on the bank of River Ganga to rafters, who have put up their tents. There is a mixed feeling amongst these villagers regarding the government's decision to allow rafting and camping on the River Ganga. Though a majority of the villagers are in favour of such activities because they draw direct and indirect economic benefits from them, one section felt that there was more damage done to the environment and that their traditional social and cultural fabric was being threatened.

Economic transaction in rafting and camping

Rafting, kayaking and camping on the River Ganga from Byasi to Rishikesh are regulated and subject to fluctuations in the weather and climatic conditions. The camps are closed from May onwards till September due to high wind and heavy water current during the rainy season from the end of June to mid-September. The upper reaches and gorge sections of the Ganga are limited to experienced paddlers. The Lower Ganga from Byasi to Shivpuri is the most popular reach of the river and is used by rafters, kayakers and boaters. There are no precise details available about the total number of participants in such activities prior to 2004. The Forest Department, Government of Uttarakhand regulates such activities and issues permits to private operators. Figure 3 gives the total number

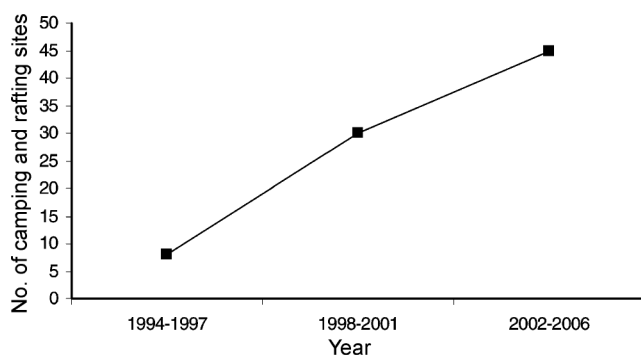


Figure 2. Growth of camping and rafting sites 1994–2006.

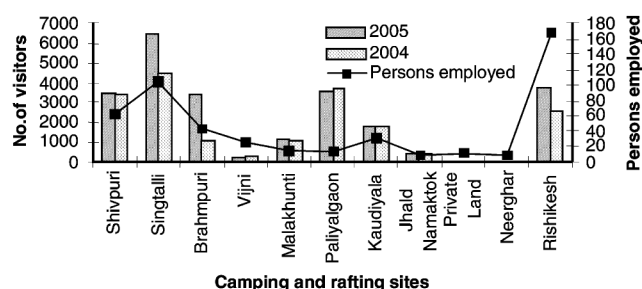


Figure 3. Number of visitors and persons employed at various camping and rafting sites.

of tourists/visitors at the camping sites in 2004 and 2005, according to data collected from the Office of the Divisional Forest Office, Munikireeti. It is interesting to note that there were 13–14% foreign tourists, and the number of foreign tourists is on a gradual increase. Commercial and private rafters use the River Ganga between Marine Drive and Shivpuri for paddling. In 2004–05, approximately 12,726 visitors used commercial rafting companies for paddling.

There is no direct benefit to the local population of the villages spread around this 25 km stretch between Kaudiyala to Shivpuri. There is some part-time employment of local people as cooks, drivers, river guides and daily-wage labourers. This is purely temporary and valid only for the rafting period, i.e. from September to June. However, there are a number of indirect benefits such as increased sale in the small, roadside eating joints (dhabas) during the rafting period, small periodic contract works and sale of few local vegetables. A few enterprising individuals from Shivpuri have joined hands to become rafting operators, and have also employed local persons to assist them. The total number of locals employed was around 503 in 2006 (Figure 3) in all the camping and rafting sites. The average income of these people varied from Rs 1500 to Rs 2500 per month plus free boarding and lodging. The Forest Department gets beach royalty at the rate of Rs 3–5 per sq. m from the camp operators and a raft tax of Rs 2500 per raft per season. The income to the tourism department is also Rs 2500 per raft per season. The income earned by the Forest Department and Tourism Department from 2003 to 2007 is presented in Figure 4. The major share of income from this sector goes to the camping and rafting companies owners from urban areas in Uttarakhand and Delhi.

Institutional norms and actual practices

The locations for camping sites are allotted by the Forest Department for a particular season. The security of the forested areas around the camp sites has been given to the camping company. River rafting is not permitted after 6 pm and all rafts should be numbered in bold. The use of fuel wood is strictly prohibited inside the camp for cook-

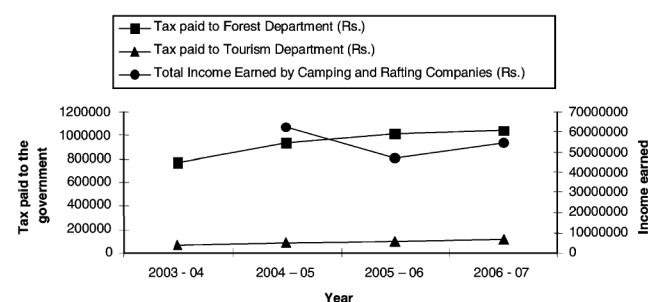


Figure 4. Income earned by camp and raft operators, and tax paid to government departments.

ing purposes. Camps are not allowed to use generator sets for lighting purpose, and are also not allowed to use pump sets for water supply. Camps are allowed to use only solar lights and lanterns inside the tents. No light is allowed beyond 9 pm in the night. Music and bursting of crackers are totally prohibited in the camps. Toilets are permitted in the form of dry pit tanks situated 60 m away from the sand back of the river beach. The solid wastes generated from the camp sites are not allowed to be dumped near the river, but are to be disposed through the municipal dustbins. The provision for camp fire is limited; it is only allowed on weekends and Gazetted holidays. Camp fire is only allowed on a metallic plate and not on the beach and should not stretch beyond 11 pm. The ashes left after the burning of the camp firewood is not allowed to be disposed in the river; it is to be collected and thrown in the municipal dustbin. The wood required for camp fire is to be procured from the forest depot and not from any other source. The use of any kind of detergent is prohibited, it also includes washing of clothes and utensils. The Forest Officer can inspect any camp site at any period of time without prior information.

It has been observed that almost all camp operators use more area of the beach than what is actually allotted to them. Most of the toilet tents are situated near the living tents and are not more than 10 m away from the sand back; in many cases they are situated right on the sand itself. The location of toilet tents in most cases is within the submergence levels of the Ganga during the rainy season. Though some dry soak pits have been made according to the norms, most of them get submerged under water during the rainy season and wash away the old deposits. It is well known that the level of river rises by 5 to 6 m during the peak rainy season, and almost all toilet tent locations get submerged under water during this season. Photographs of toilet tents collected from many camp sites show that the norms have not been followed. It has also been observed that there is campfire whenever tourists are there in the camps, and the timing is also beyond the permissible limits. The use of metallic plates to hold the camp fire wood is not followed and disposal of ash into the municipal dustbin is not done. It has been noticed that the unburnt wood and ashes are thrown in the river. Though fishing is prohibited, some tourists have been observed with fishing rods at various locations on the river during peak camping season. Detergents were used to clean the utensils.

Ecological and cultural impact assessment

It is well known that globally biodiversity has declined by 40% from 1970 to 2000, and during the same period, the ecologic footprint of man grew to exceed the biological capacity of the earth by 20%. The impact of development and commercialization has divided the world between the rich and the poor; the developed Western world (with

17% of the world's population) currently consumes 52% of the total global energy, and more areas rich in natural vegetation and biodiversity are gradually being drawn under the clutches of development. Similarly, under the garb of whitewater rafting and camping, this less disturbed area in Uttarakhand has also come under the threat of human desire. The region is already under considerable pressure due to the ever-increasing demands made by local populations on environmental resources. Energy requirements for heating and cooking for the local population, timber for construction, and the grazing and forage requirements of livestock often translate into a heavy demand on the fast-dwindling forest resources. The quantum of ecological disturbance is increasing day by day due to gradual increase in the number of people present in this area. The widening of the existing Badrinath–Rishikesh highway, the increasing vehicular movement on this road, and construction of houses, shops and hotels have added to the ecological disturbance. The sporadic increase of commercial camping and whitewater rafting has already impacted severely on the forests of the narrow Ganga valley between Devprayag and Rishikesh. The new disturbances to the campsite vegetation, soil, river sand and water are increasing every year. Human effects on animal distribution, abundance, and behaviour will be too less to be biologically significant in the initial years. However, due to the linear nature of river use, which is quite different from the more random pattern of use within this stretch, the three or four most popular campsites (Shivpuri, Singtalli, Brahmpuri and Kaudiyala) along the river which is occupied now almost 100% of the nights during the years. Impacts at these popular campsites include loss of vegetation, soil compaction, disturbance in the existing water channels, and other evidence of use. Displacement of wildlife has occurred in the region due to bright colours of tents, toilet tents, rafts and loud music and lights in and around camp sites. According to a survey conducted among the rural population of this area, prior to the camping and rafting activities, animals were frequently spotted on river side while drinking water and resting on the sand beach; now they are not visible in the area for months, especially during the camping and rafting season (Table 2). The number of monkeys and wild boars around camp sites has increased, as they get left-over food items to eat. A thorough ecological impact assessment of camping and whitewater rafting would bring out certain benchmark indicators and based on them further EIA studies could be conducted to ascertain the impact of camping and rafting on the River Ganga and the surrounding forest. The quantum of garbage generated by tourists at Shivpuri, Singtalli and Brahmpuri is a major concern and needs immediate quantification. However, with well-coordinated local initiatives, local institutional systems for environmental care can be developed as demonstrated by the Sagarmatha Pollution Control Project in the Everest Base Camp area in Nepal.

Table 2. Spotting of animals by villagers of the surrounding areas before and after the start of camping/rafting

Animal	Activity/time/place when spotted	Month spotted											
		J	F	M	A	M	J	J	A	S	O	N	D
Barking deer (<i>Muntiacus muntjak</i>)	Grazing, drinking water	– +	–	–	–	– +	– +	– +	–	–	–	–	– +
Sambar (<i>Cervus unicolor</i>)	Grazing, drinking water		–	–	–	– +	– +	– +		–	–		
Rabbit (<i>Lepus nigricollis</i>)	Evening, forest		–	–	–	– +	– +		– +	–	–	–	
Monkey (<i>Rhesus macaque</i>)	Daytime	– +	– +	– +	– +	– +	– +			– +	– +	– +	– +
Wild boar (<i>Sus scrofa</i>)	Morning and evening	– +	– +	– +	– +	– +	– +			– +	– +	– +	– +
Langur (<i>Presbytis entellus</i>)	Forest, drinking water	– +	– +	–			–	–				– +	– +
Fox (<i>Vulpes bengalensis</i>)	Morning and evening	–	–	–		– +	– +		–	–	–		–
Jackal (<i>Canis aureus</i>)	Barking in the evening	– +	– +	–	–	–	–	–	–	–	–	–	– +
Leopard (<i>Panthera pardus</i>)	Night	– +	–	–	–						–	–	– +
Black bear (<i>Salenarctos thibetanus</i>)	Late evening					–	–	– +					
Goral (<i>Nemorhaedus goral</i>)	Grazing, drinking water	–	–	–	–	–	– +	– +	– +	–	–	–	–
Mongoose (<i>Herpestes edwardsi</i>)	Forest, daytime	– +	–	–			– +	– +		–	–	–	–
Wild cat (<i>Felis bengalensis</i>)	Evening and night	– +	–	–	–	–	– +	– +	– +	–	–	–	–
Porcupine (<i>Hystrix indica</i>)	Late evening	– +	–	–		–	–	–		– +	– +	–	– +
Common otter (<i>Lutra lutra monticola</i>)	Late evening	– +	– +	–			–	–				– +	– +

–, Spotting before the start of camping/rafting; +, Spotting after the start of camping/rafting.

Table 3. People's perception on the impact of rafting and camping

Positive impacts	Negative impacts
Direct and indirect income generation	Decline in traditional agriculture, animal husbandry and traditional crafts
Infrastructural development	Introduction to commercialization
Popularity of the region and its villages	Change in mindset of youth
Increased sense of belongingness to the area	Increased dropouts from schools
Increased living standards of the people	Less preference for traditional food
Easy acceptance of new things	Decline in traditional values and culture
Exposure and skill development	Less respect for village girls, women and elders
	Class consciousness and frustration
	Increased burden on women
	Family break-ups
	Increased out-migration

The impact of tourism on society is an established fact and various studies have brought out startling facts and figures on the subject. Thus it is important to assess the cultural impacts of camping and rafting in the light of the changing social and cultural fabric of the traditional soci-

ety of this region. There is a growing disgruntled feeling in the minds of the local villagers about the camping and rafting activities. The younger generation is the worst affected, as children have started escaping their school and prefer to earn money by working in and around these

sites. The locals are also not willing to pursue traditional subsistence agriculture and animal husbandry. Some of the villagers have changed their land use and now prefer to cultivate vegetables and earn more money rather than opt for their traditional cultivation. Farmers in some villages have taken to more cultivation of maize, as it

fetches them ready money after selling raw maize corn (bhutta). The traditional women and young girls of these villages now have to go far away from these sites for washing and bathing purposes. The traditional use of these river beds by the migratory sheep and goat herders, who folded their livestock at night-time during their



Figure 5. *a*, Rafting in progress; *b*, Camping activities; *c*, Campfire remains on river beach; *d*, Toilets located right on the sand of river; *e*, Social and cultural impact on Mala village; *f*, Elaborate dining facilities; *g*, Employees of a camp and *h*, Various kinds of impact on Ganga river.

annual migration to the foothills (October and November) and on their way to alpine meadows (March and April) has also stopped due to these activities. The traditional exchange of livestock and grains and maintenance of animal diversity by these villagers has also suffered drastically. A few villages also find it difficult to cremate dead bodies, as they are located near the camp sites. Table 3 lists the perception of the people in the villages around the camping and rafting sites about the impact of such activities on their society. It is interesting to note that the villagers find more negative impacts than positive ones, and have concluded that in due course their status would be reduced to daily-wage labourers from farmers.

Visitor, resource management and research

In order to preserve the wilderness character, minimize disturbance to the existing forests and wildlife and other river resources as well as to provide quality experience to the visitors, there is strong need to limit the number of camping sites as well as tourists for rafting and camping per day. Similarly, there is also a need to fix the size of the groups, including clients, staff members, rafters and trainers. No group or individual should be allowed to remain longer than three consecutive nights in the same campsite. This mandatory restriction is intended to prevent long-term occupancy of campsites, minimize campsite deterioration and disruption of wildlife use patterns. Exceptions may be granted where this adverse impact can be avoided.

Research data and basic inventory information contribute to the understanding of the natural systems and the effects that visitor use activities may have on the immediate environment. The resource inventory, monitoring, and research policies and programmes should be implemented in the campsites. The monitoring includes a description and photographs taken from the same points on a periodic basis. This effort to monitor campsites should continue. Recreational use of the river has led to some physical and biological impacts on the river environment, such as improper disposal of human waste, litter, loss of vegetation and development of trails, occasional fire rings, water pollution, and disturbance or displacement of wildlife. These impacts can be reduced if river users assume responsibility to decrease their impacts. On the whole, the vast majority of river users appear to make a concerted effort to minimize evidence of human use.

Conclusion

Tourism on the banks of River Ganga has become a double-edged activity due to the heavy influx of tourists and lack

of proper implementation of rules and regulations. It has the potential to contribute, in a positive manner, to socio-economic achievements, but at the same time, its fast and sometimes uncontrolled growth is also leading to the degradation of the environment and loss of local identity and traditional culture. Negative impacts from camping and river rafting occur because of the inability of the environment to cope with the visitor use and the widening of the national highway within the acceptable limits of change. Certain uncontrolled activities such as location of toilets within the submergence area of the river beach during rainy season, trekking in the forests and regular camp fires pose potential threats to the immediate environment around the river and to the quality of river water. This can also put enormous pressure on the area and lead to impacts such as soil erosion, increased pollution, natural habitat loss, increased pressure on certain endangered species and heightened vulnerability to forest fires. It has been observed that river rafting and camping on the river beach give rise to three major effects on the environment. Stress to local communities from environmental degradation and increased infrastructure costs. Physical influences causing social stress; the physical impact and the rising tourism inflow and its consequent developments have led to acute social stress. Socio-cultural disadvantages from conflicts due to use of resources, decline in culture, and friction with traditional land uses. Camping and rafting also add to the pollution. It may even result in resource-use conflicts, such as competition between tourists and the local population for use of prime resources like water and energy because of scarce supply. Thus there is a need for comprehensive ecological and social impact assessment studies, before the situation worsens.

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ACKNOWLEDGEMENTS. We thank the Director, G.B. Pant Institute of Himalayan Environment and Development, Kosi, Almora for encouragement and the various camp owners for their cooperation during the social survey and discussions.

Received 31 July 2007; revised accepted 23 January 2008