

CHALLENGES OF “ECOTOURISM” IN KEDARNATH: SOME INSIGHTS FROM THE GROUND

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Abstract

This study attempts to identify the environmental and cultural challenges thrown up by the growth and development of tourism in Kedarnath Region, located in the southern part of Kedarnath Wildlife Sanctuary in Rudraprayag district of Uttarakhand. Using primary data collected through questionnaires and interviews, the paper examines the issue through the eyes of local service providers and administrators. Overall, it finds that there is a widely shared dissatisfaction with the state of affairs, with a general sense that the huge inflow of tourists in recent years has strained Kedarnath to breaking point. Growing mounds of plastic waste, streets overflowing with horse-mule excreta and the influx of tourists that lack sensitivity towards the local culture are just some of the issues that made the respondents feel that all was not well with the way tourism was being managed in the area. The accounts shared in the paper would serve to highlight the need for serious engagement by policy-makers and regulators to take eco-tourism from just being a nice-sounding concept to a tangible reality on the ground.

Keywords: Eco-Tourism, Environment Conservation, Kedarnath Wild Life Sanctuary

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All photographs by Arun Singh

1. Introduction

In states like Uttarakhand, tourism plays an outsized role in the economy, creating tens of thousands of local jobs and contributing generously to the state exchequer. However, the economic benefits of tourism come at a price – unchecked growth in tourism usually goes hand in hand with environmental degradation, marginalization of local communities and rapid erosion in traditional cultural values (Gupta et al., 2023; Joshi et al., 2021). The concept of eco-tourism emerged in part to address this very issue. An offshoot of the broader discourse around sustainable development– eco-tourism tries to develop models of tourism that incorporate concerns around conservation and inclusiveness.

In Uttarakhand too, the government aims to transform tourism in the state into “eco-tourism”. While this assumes relevance across all destinations in the state, it is especially crucial for Kedarnath which suffered catastrophic losses during the 2013 floods (Joshi et al., 2021). Although that tragedy is categorized as a “natural disaster”, its impact was magnified by poor developmental choices. As unregulated construction to accommodate rising tourist numbers was one the factors that made the 2013 floods so devastating, sustainability issues are hardly an academic concern for the residents of Kedarnath, as well as the millions of Indians who hold the site in reverence.

Against that backdrop, this paper presents a ground report from Kedarnath to assess the extent to which the ideal of “eco-tourism” has been realized in the town and surrounding areas. By means of unstructured personal interviews and discussions with local service providers as well as with local government staff, the paper attempts to bring out the key concerns of people who are directly impacted by local tourism.

As the problems and suggested remedies come straight from those with the most direct stake in the local tourist economy, they should be taken seriously by researchers, administrators and policy-makers as they wrestle with the challenge of creating jobs and income for locals while also preserving the distinct ecological, cultural and spiritual heritage of Kedarnath.

2. Ecotourism– Conceptual Background

Ecotourism, a subset of sustainable tourism, has emerged as a vital approach to conserve the environment while promoting economic development in local communities. The concept of ecotourism has evolved over the years, leading to various definitions and interpretations.

According to the International Ecotourism Society (TIES), ecotourism is "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" (TIES, 2015).

The International Union for Conservation of Nature (IUCN) emphasizes the importance of ecotourism in supporting protected areas, stating that "ecotourism can be a powerful tool for conservation, providing economic benefits and incentives for local communities to conserve natural resources" (IUCN, 2017).

The United Nations World Tourism Organization (UNWTO) defines ecotourism as "a type of tourism that involves traveling to natural areas that are relatively undeveloped, in order to experience and enjoy nature, while also promoting conservation and sustainability" (UNWTO, 2019).

These definitions highlight the key components of ecotourism, including environmental conservation, local community involvement, education, and sustainability.

In recent years, ecotourism has moved beyond mere academic discussions and has found a place in public policy. In India, the Ministry of Tourism rolled out the National Strategy for Ecotourism in 2022 to promote sustainable and responsible tourism practices in India. It aims to balance economic growth with environmental conservation and social responsibility, while enhancing the overall tourism experience. The strategy focuses on the following key areas:

(i) Sustainable Tourism Practices: To encourage environmentally friendly practices, such as reducing plastic use and promoting eco-friendly accommodations.

(ii) Community-Based Ecotourism: To empower local communities to manage and benefit from ecotourism initiatives, promoting cultural heritage and traditional skills.

(iii) Conservation and Restoration: Emphasize the importance of conserving and restoring natural and cultural heritage sites, including protected areas and monuments.

(iv) **Tourism Infrastructure Development:** Aims to develop sustainable tourism infrastructure, including eco-friendly accommodations, transportation, and amenities.

(vi) **Marketing and Promotion:** Focuses on promoting India's ecotourism destinations and experiences, highlighting unique selling propositions and competitive advantages.

3. Study area

The present study was carried out in the Kedarnath area of Rudraprayag district of Uttarakhand between 2022 and 2023 during the tourist season (i.e. the period from May to October). Kedarnath town is nestled in the mighty Garhwal Himalayas. The town, built around the revered Kedarnath temple, is located at an altitude of 3,580 m, near Chorabari glacier, which is the source of the river Mandakini. Dedicated to Lord Shiva, the ancient temple has exquisite architecture and is built of extremely large but evenly shaped grey stone slabs. A conical rock formation inside the temple is worshipped as Lord Shiva in his “Sadashiva” form. The historical name of this region is “Kedar Khand” and legend says that the Pandavas from the epic Mahabharata, after having defeated the Kauravas, felt guilty for having killed so many people and sought the blessing of Lord Shiva for redemption.

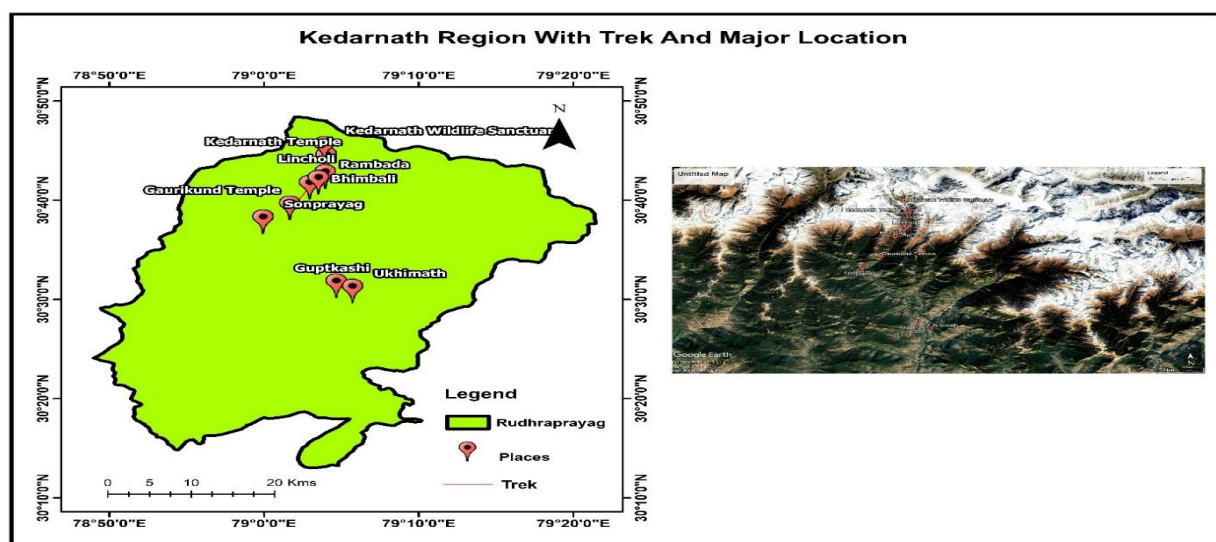


Figure 1. Location of Kedarnath region in Rudraprayag (Prepared by Arun Singh)

While Kedarnath being one of the famed Char-Dham of Hinduism has always attracted pilgrims from across the country, improved infrastructure in recent years has increased the flow of pilgrims, posing a new set of challenges that this paper seeks to address.

4. Methodology

The researchers used unstructured interviews and discussions with 90 service providers (30 each selected at random from across transportation, business/trade and management service sectors respectively) to get an in-depth understanding of their perspectives on the local tourism industry. It was felt that this approach was more likely to get the respondents to open up and share their views freely compared to structured interviews where the range of responses is constrained by the format of the questionnaire/interview schedule. As one of the researchers is a native of the area and is familiar with its language and customs, he was able to put the respondents at ease and elicit candid responses from them.

What follows is a distillation of the respondents' views across a range of issues related to local tourism in the Kedarnath area.

5. Over Tourism/Mass tourism

Almost all respondents saw the unchecked rise in tourist numbers as the root cause of all other problems in Kedarnath. And this impression of locals (that the Kedarnath area has witnessed a massive unsustainable surge in tourist arrivals in recent years) is supported by data from various sources.

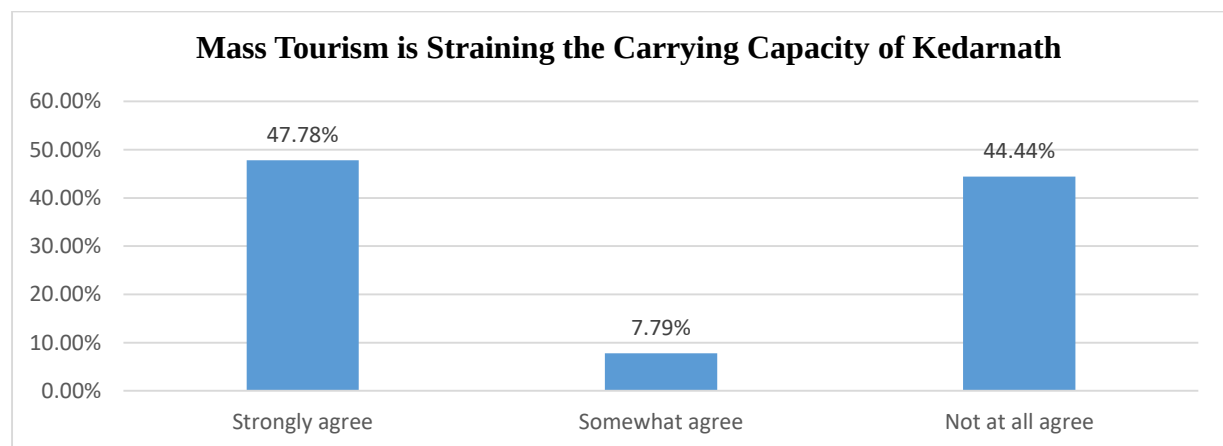


Figure 2. Respondents' perception on mass tourism (Source: Authors' calculation based on Primary data)

The results show that nearly half of the respondents believe that tourism in Kedarnath exceeds its sustaining capacity. More than 47 percent of respondents strongly agree that mass tourism is straining the sustaining capacity of Kedarnath, while approximately 8 percent of the respondents somewhat agree, indicating a milder agreement but still acknowledging the negative impact of mass tourism.

Table 01: Tourist Arrivals in Kedarnath (2003 to 2023)

Year	Indian Tourists	Foreigner Tourists	Total Tourist Arrivals
2003	2,31,988	2,509	2,34,497
2004	2,75,149	1,257	2,76,406
2005	3,78,162	4,811	3,82,973
2006	4,85,464	1,539	4,87,003
2007	5,55,918	1,505	5,57,423
2008	4,68,982	1,066	4,70,048
2009	4,02,633	1,003	4,03,636
2010	4,00,243	268	4,00,511
2011	5,69,863	738	5,70,601
2012	5,72,454	598	5,73,052
2013	3,33,693	81	3,33,774
2014	40,718	228	40,946
2015	1,53,821	614	1,54,435
2016	3,09,069	695	3,09,764
2017	4,70,517	718	4,71,235
2018	7,30,387	1,604	7,31,991
2019	9,98,956	1,065	10,00,021
2020	1,35,287	62	1,35,349
2021	2,42,985	27	2,43,012
2022	15,63,280	968	15,64,248
2023	19,57,609	1,254	19,58,863

Source: Uttarakhand Tourism Development Board

According to figures brought out by the Uttarakhand Tourism Development Board (Table 1), the total number of tourists in the Kedarnath region has increased from 5,73,040 in 2012 to 15,63,275 in 2022. While consolidated data after 2022 is not available, tourist numbers have almost certainly increased even further since then. The almost three-fold increase in tourist numbers over the past decade clearly exceeds Kedarnath carrying capacity. More than anything else, this explains why the Kedarnath's infrastructure and services have reached breaking point.



Figure 3. Authors' calculation based on secondary data (2003 to 2023).

(Note: The sharp drop in tourist numbers after 2013 was due to the devastation caused by the floods that year. 2020 and 2021 also saw decline in numbers on account of COVID restrictions. Even so, the rebound in 2022 is remarkable, and the trends in the two years since indicate no let-up in tourist flows.)

Every other problem highlighted in this paper is the direct by-product of unregulated tourist inflows, as Kedarnath's infrastructure and public services have not kept up with the demands placed on them.

6. Pollution and Sanitation Services

According to the selected respondents from the study area, while the local administration does make an effort to implement effective management strategies at the start of every tourist season— encompassing waste management, toilet facilities, and arrangement for sanitation workers— the efforts are undermined by over-tourism. This is on stark display in the overwhelming number of horse-mule operators working in the area in any given season. The volume of excreta generated as a consequence far exceeds the capacity of local sanitation workers to clean up.

According to respondents, the excrement from horses and mules poses two significant challenges: it renders paths slippery and increases the risk of respiratory illnesses, such as coughing, among service providers. Plus, it contaminates the local water sources. Inadequate availability of safe drinking water, in turn, prompts tourists to rely on plastic water bottles, which are subsequently discarded at the destination. This adds to the ever-growing menace of plastic waste, which is compounded by the throwaway plastic raincoats used by tourists.



Photo 1. Mounds of plastic waste in Kedarnath



Photo 2. Mules and horses create challenges for sanitation workers.

Service providers reported that they have made arrangements for managing up to 80% of the waste, with daily pick-up by sanitation workers who dispose it off at a designated dumping zone. However, only plastic bottles are transported for recycling purposes, while other plastic waste is abandoned. This adds to the mountains of waste along the entire pilgrimage trail.



Photo 3. Garbage dumps highlight the poor state of waste management in Kedarnath area

Service providers also noted that before the 2013 disaster, the number of tourists was significantly lower, allowing for more effective waste management and maintenance of cleanliness. The strain placed on local public services by the recent surge in tourist numbers is most visible in the area of waste management. A subset of respondents observed that sanitation quality has improved in recent years, as more and more people have transitioned away from open defecation to indoor toilets. However, the sewage system remains a significant challenge, with nearly all respondents expressing dissatisfaction with it. The construction of small sewage pits has proven inadequate, as they rapidly fill up with daily use by approximately 1500 individuals, prompting a reversion to open defecation. Furthermore, the quick filling of pits renders toilets unusable, even for those who place a high value on hygiene. Respondents noted that the government has only made provisions for a mere 7% of the required toilets.



Photo 4. Locked toilets due to the filling up of sewage pits have led to reversion to open defecation in some places

Municipal officials, for their part, mentioned how maintaining adequate levels of cleanliness has become practically impossible because at the beginning of the pilgrimage season (May-June), the number of tourists and service providers like horse, mules, *dandi* and *kadi* operators far exceeds their capacity to cope. Massive crowding also ensures that even the 600 to 700 sanitation workers available on-site don't have enough free space available for cleaning. The officials say that most of the pollution occurs during the June rush, a claim backed by local residents.

The sanitation workers meanwhile complained about how it is virtually impossible for them to do their job as tourists do not like dust being kicked up as they sweep the streets covered in horse and mule excrement.

Earlier studies of Kedarnath region found that solid waste pollution including plastic, food waste and human waste has increased significantly due to lack of proper waste management and infrastructure in Kedarnath. This has created garbage, pollution and health hazards for tourists and local people. But as pointed out above, the problem isn't that the government does not make adequate arrangements, but that the galloping demand far outstrips the system's capacity to cope.

7. Resource Depletion and Growing 'Concretization'

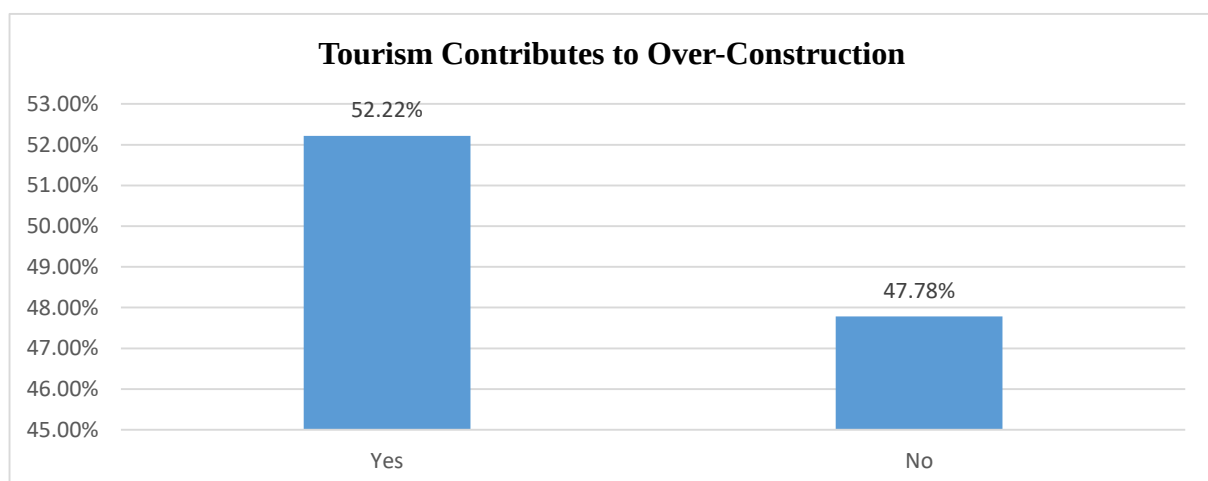


Figure 4. Mass tourism and the threat of over-construction

This above figure shows the responses to the question, “Do you think tourism has encouraged over-construction?” The result shows that the respondents are about evenly split on the issue, but the very fact that nearly half the respondents are concerned over the scale of construction

in Kedarnath underscores the need for policymakers to address misgivings surrounding tourism and over-construction to ensure more sustainable development practices.

8. Tourism Activities and Perceived Loss of Open Spaces

Selected respondents of Kedarnath area say that businesses have appropriated all the natural landscapes for their narrow commercial interests. Among the major attractions of the Kedarnath area are its lush, spacious meadows (*bugyals*). In recent years, however, these have become little more than camping sites, teeming with tents and *dhabas* all through the tourist season. The respondents were uniformly dismayed by the aesthetic and ecological loss.



Photo 5. “Bugyals” across the region are now little more than camping sites.

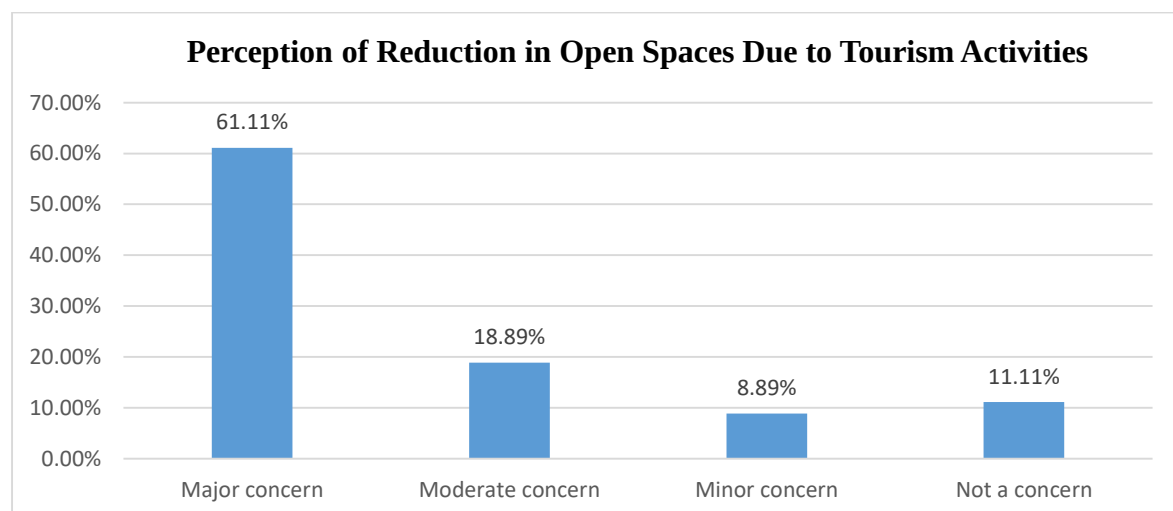


Figure 5. Loss of Open Spaces Due to Tourism Activities. (Source: Authors' calculation based on Primary data)

Locals blame the government for the “concretization” of the area because not only has the administration permitted over-construction on a large scale, it has actually gone on to build large structures of its own. This is despite the fact that the Kedarnath area is known for being ecologically sensitive with marshy land that may not withstand the increased load of the cement and steel structures springing up everywhere.



Figure 6. New structure coming up in Kedarnath town. Over-construction has led to the “concretization” of open spaces.

Experts have warned that ongoing heavy construction may lead to more trouble if a 2013-like situation recurs. According to experts, the Kedarnath shrine area is “highly fragile and unstable terrain” (Prithviraj Singh, December 2021), and construction is being done on debris deposited by the 2013 floods. All the construction work is being done on debris deposited by the 2013 floods, said retired scientist and glaciologist from the Wadia Institute of Himalayan Geology, D. P. Dobhal. “The temple area known as Kedarpuri is a V-shaped valley. It’s a highly fragile and unstable terrain. “A similar report was prepared by the Geological Survey of India as well. This is bound to create trouble in future. What was the compulsion to undertake heavy construction works at the pilgrimage site? Big constructions are not needed if pilgrims are not allowed to stay there for too long,” the senior scientist further said. (Prithviraj Singh, December 2021)

The 2013 flash floods, caused by heavy rain, had triggered widespread destruction in Uttarakhand. Experts who were part of investigations and reports presented to the Uttarakhand

government after the 2013 disaster have categorically stated that ongoing construction works in Kedarpuri island may lead to more trouble if the situation re-emerges in future (Singh P., 2021).

Environmentalists of the region stress that no lesson has been learnt from the disaster so far. State authorities are continuing with their massive construction projects in ecologically sensitive areas and are even looking at relaxing the stringent rules that are in place to protect these areas (Aggarwal, 2018).



Photo 7. Infrastructure development is often carried out without regard for ecological and aesthetic concern.

During discussions, respondents kept bringing up the proliferation of *dhabas* and tent sites, which has resulted in the progressive vanishing of open spaces. The government itself gives seasonal permission to service providers to create income-streams for unemployed local residents. However, over the past decades people from other states have come in and set-up businesses in Kedarnath, adding to over-commercialization.

Notably, the government has also contributed to this trend, as evident from the Garhwal Mandal Development Corporation's excavation of meadows and installation of permanent, cement-based tents.



Photo 8. Garhwal Mandal Development Corporation's excavation of meadows and installation of permanent, cement-based tents. These tents have ruined the natural beauty of 'bugyals'

As a consequence, the long-standing principle of unimpeded access to common resources is being progressively eroded which has, among other things, led to the exclusion of marginalized communities, who depend upon *bugyals* and surrounding forests for their subsistence.

9. Locals getting squeezed out

A common complaint across the study area was the double whammy suffered by local residents. On the one hand, they witness the aesthetic and ecological destruction of their living space, on the other they aren't even the principal beneficiaries of the monetary gains flowing from unregulated tourism.

Even though the number of tourists has exploded, it hasn't necessarily translated into higher incomes for service providers, as the number of vendors has also increased correspondingly. Moreover, the bulk of new business generated by runaway tourism is being cornered by outsiders. This has, among other things, raised the cost of living for long-time residents. The most obvious example of this is the increased cost of housing, which was mentioned by several local residents.

Local service providers also suffer from a lack of proper regulation which has led to a marked deterioration in service quality. Several local vendors claimed that outside operators do not have a sense of belonging and responsibility towards the region, and often engage in unethical practices like price gouging, sub-par service delivery and misbehavior with visitors. As tourists

are unlikely to be able to tell the difference between local and outsider service providers, any unpleasant experiences that they might have get blamed on indigenous communities

For several respondents, the core issue was the absence of proper land-titles conveying effective property rights to the locals and lack of restrictions on outsiders buying local land. This lack of institutional protection for local residents was widely blamed for the influx of service providers from outside Rudraprayag district, including from Bageshwar, Kotdwar, Kinnaur, and Dehradun and even Jammu & Kashmir and Himachal Pradesh.

10. Cultural pollution

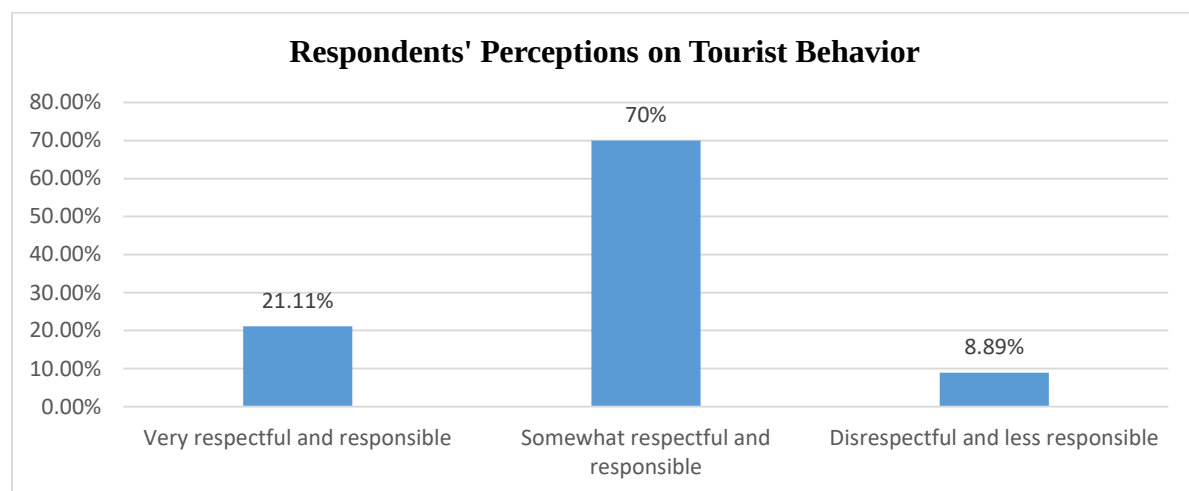


Figure 6. Tourist Behavior: Perceptions of Respect and Responsibility. (Source: Authors' calculation based on Primary data)

The results indicate a mixed perception of tourist behavior in Kedarnath, with 70 % of respondents viewing tourists as somewhat respectful and responsible, 9% as disrespectful and less responsible, and only 21% as very respectful and responsible, highlighting room for improvement and the need for education and awareness to promote more responsible tourism practices.

Respondents reported that as recently as a decade back, the majority of visitors to the Kedarnath area were pilgrims, with adventure enthusiast and trekkers making up most of the rest. With improvements in the road network in recent years – not to mention higher disposable incomes – it has become a lot easier for casual weekend revelers to reach Kedarnath. The problem is that this new breed of tourists often doesn't possess the religious reverence of pilgrims or the

ecological sensitivity of nature-lovers. Almost all the locals the researchers spoke to – whether service providers or ordinary residents – were dismayed by the changing profile of visitors. There was near unanimous disapproval of the obtrusive boisterousness of sundry “You Tubers”, “influencers” and other casual tourists who are utterly oblivious to the sanctity Kedarnath holds for residents and pilgrims alike.

A few hotel owners mentioned how some tourists now even demand alcohol and other narcotics at pilgrimage sites, something that was unthinkable until just a few years back. The worst part is that such behavior is often emulated by local youth. The cultural anxieties surrounding unregulated mass tourism near a revered pilgrimage site were palpable all across the study area.

11. Traffic Congestion

An efficient and well-developed transport system is an essential pre-condition for the rapid development of tourism. However, since eco-tourism, by definition, incorporates responsible travel, no compromise can be made with environmental protection in the development of travel and transportation at tourist sites.

To give the sense of the scale at the problem, we only need to look at news stories reporting over one lakh arrivals each year written days of the opening of temple gates (Hindustan Times, 2024).

Unfortunately, the transport system around Kedarnath falls well short of the standards expected of an “eco-tourism” site. On the one hand, as discussed earlier, the construction of highways right up to Kedarnath has led to an explosion in tourist volumes, on the other, the inability to plan for local transport in and around Kedarnath has made the traffic congestion problem much worse at the local level.

To give an example, before the terrible disaster of 2013, vehicles used to go from Sonprayag to Gaurikund (a distance of about 5 km) without proper traffic management, which often led to traffic jams. After the parking lot of Gaurikund was washed away during the disaster, the government launched a “shuttle” transportation service in 2014, to provide free local transport to visitors. The idea was to reduce the burden of private vehicles while ensuring that tourists were not inconvenienced. At the time of launch, the government used to give ₹ 900 per day to each vehicle owner. By the year 2018, there were about 150 vehicles in the shuttle service,

which had risen to 200 vehicles by mid-2023. Despite the improvement in traffic situation due to the service, as the road from Sonprayag to Gaurikund is single-lane, traffic snarls are still all too common. At times the situation is so bad that vehicles get stopped one kilometer ahead of destination, with tourists being forced to cover the last stretch on foot.

In a sense, this is the worst of both worlds – a flood of tourists, well beyond the area’s coping capacity, right up to the gates of Kedarnath, and poor management thereafter, often leaving visitors stranded.

12. Glimmer of Hope

While the foregoing accounts suggest that judged on the parameters of ecological sustainability and well-being of the local community, the project of “eco-tourism” in Kedarnath has been a disappointment, there are reasons to be hopeful for the future.

A subset of respondents noted that the growth of trekking activities has led to a significant increase in environmental awareness among visitors, with a growing proportion of tourists exhibiting heightened awareness about pollution. Historically, trekkers were responsible for generating substantial amounts of waste in the region. However, the emergence of eco-tourism has precipitated a shift in tourist behavior, fostering greater environmental awareness among the general public. Notably, service providers have implemented measures to collect and dispose of plastic waste from eco-tourists in an environmentally responsible manner.

13. Challenges in Management

Figure-7 summarizes the major challenges experienced by service providers in the management of ecotourism in Kedarnath, highlighting that the key challenges identified by the respondents including include a lack of sanitation and sewage infrastructure (42.22%), traffic congestion (26.67%), absence of regulations and standards (33.33%), and inefficiency in waste management (18.89%). These issues reflect the pressure of mass tourism and shortcomings in management within the area.

Respondents Response on Major Short Coming in Management

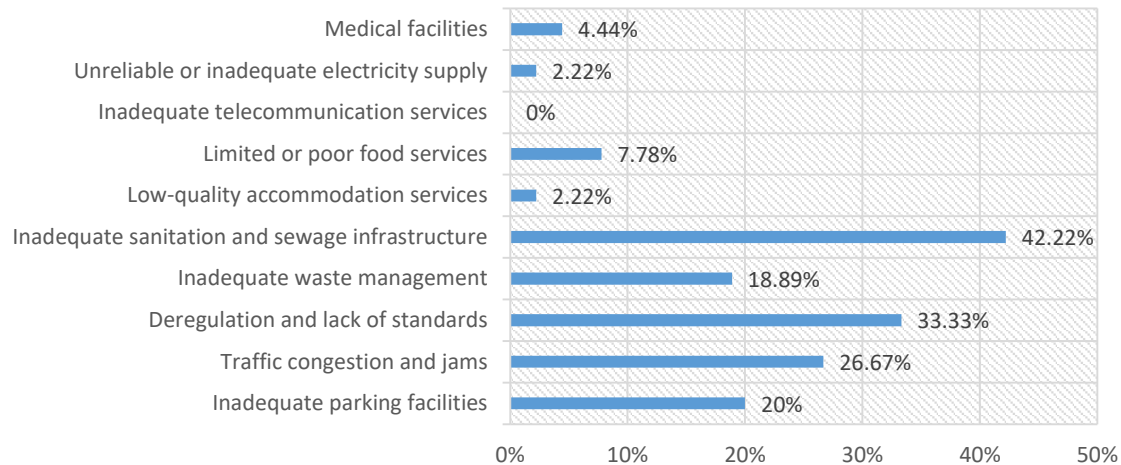


Figure 7. Major Shortcoming in Eco-tourism Management (Source: Authors' calculation based on Primary data)

Inadequate sanitation and sewage infrastructure is the most pressing issue, cited by approximately 43% of respondents, indicating a need for better infrastructure management strategies. The study also shows that lack of effective regulation, limited awareness, and education have led to environmental challenges. Primary data highlights the need for ecotourism initiatives and environmental conservation efforts led by local communities and service providers. The study emphasizes the need for a sustainable and responsible approach to tourism development that prioritizes environmental management and social responsibility. These findings suggest that addressing these shortcomings could improve the sustainability and efficiency of ecotourism in Kedarnath.

14. Conclusion

On the basis of the above accounts, we can conclude that the exponential growth of tourism in the study area has had an adverse effect on both the local environment and on the long-term interests of the local community. As such, "ecotourism" largely remains an aspiration.

Primary data highlight the negative environmental impact of unregulated tourism, including pollution, waste generation, over-construction, cultural pollution and the increasing marginalization of locals.

The findings reveal that eco-tourism is still in its infancy in the study area, and much remains to be done for its proper and coordinated development. Since the general public has not yet

become familiar with the basic idea of eco-tourism, it is quite possible that commercial interests would abuse the term to promote activities that only serve to enrich them at the cost of the local culture and eco-system.

Development of tourism is necessary but what is even more important is that development should be done within the limits of the carrying capacity of tourism sites, otherwise the destinations would be ravaged beyond repair.

The findings of the study can help us in formulating ecotourism-related policy and regulatory frameworks which develop ecotourism in a manner that is mindful of the concerns of local communities and the natural environment that sustains them.

The central theme of eco-tourism is to ensure the use of resources in such a way that they remain available for future generations. The World Tourism Organization is taking necessary steps to achieve sustainable development through eco-tourism. With environmental issues moving to the center stage of economic policy-making, an opportunity has been gained to review the worldwide experiences of eco-tourism, so that sustainable development of eco-tourism can be achieved in the future, as part of the larger project of sustainable development. This means maximizing the economic, environmental and social benefits of ecotourism with local communities being recognized as key stakeholders. To better understand ecotourism and to improve its planning, management and marketing, innovative business models should be studied and implemented globally by various companies, businessmen, governments and researchers involved in ecotourism. The experiences gained from eco-tourism should be disseminated widely to other communities and governments that could suitably adapt them to their particular circumstances.

15. Suggestions

(a) Suggestions given by service providers: Some of the main suggestions made by service providers for improving the state of eco-tourism in the area are as follows:

1. Some respondents of Kedarnath area say that the government should improve the license allocation. Around 20% of people operate their horses and mules without a license, and people involved in food processing are even less likely to have licenses. Because licensing is the job

of the District Panchayat, poor management at the panchayat level is mainly to blame for the sharp increase in the number of unlicensed operators.

2. There should be proper arrangements for disposing of plastic waste and if possible, plastic should be completely banned. The huge piles of discarded plastic raincoats left by tourists in particular is a major problem, as the Kedarnath area typically gets a lot of rain.

3. Some respondents even suggested that the operation and management of the eco-tourism destination should be handed over to the Army as the local police are inefficient.

4. Also suggested was the need to ensure compulsory registration of all visitors and the installation of check posts at regular intervals.

5. Another key suggestion was the need to install two large dustbins for dry and wet waste every 500 metres, along with CCTV cameras to monitor littering and other kinds of misbehavior.

6. Vehicular traffic in the area needs to be reduced. To achieve this, either the road should be widened or only a maximum of 150 vehicles should be operated. Due to the single-lane road from Sonprayag to Gaurikund and the huge number of vehicles, there is a chronic problem of traffic jams.

7. There should be health facilities every two to three kilometers. While there are health services at stops like Bhimbali, Jangalchatti, Rambada, awareness about them among tourists is limited because there aren't enough banners and bill-boards publicizing them. As high-altitudes can trigger health problems like hypertension and dehydration, among others, adequate health facilities are necessary for the welfare of tourists.

8. The number of tents put up at camping sites should be limited to a maximum of say 2000 or 3000 only. Ideally, visitors should be required to deposit their cell-phones before they enter Kedarnath. Tourists should also be prohibited from bringing liquor and other undesirable objects into the sacred site.

9. The employment of minors should be banned, as the availability of easy money at a tender age has contributed to the rise of drug addiction among the local youth.

10. The lanes for pedestrians and horses & mules should be separate. Even if there is only one path, it should be widened so that a divider can be installed in the middle of the path. And every two to three kilometers, there should be crossings linking the two lanes for tourists who wish to ride horses.

11. The total number of service-providers should be capped so as to reduce the number of outsiders working in the area. The travel time of mules from Gaurikund to Kedarnath should be limited. If horses and mules are required to stop for 10 minutes every 2 kilometers, then the sanitation workers can also do the cleaning in that time.

12. Violations of rules should be punished with the cancellation of license instead of a challan as the challan amount is usually too small to be a deterrent.

13. Horse and mule operators should form a union with agreed-upon rates for rides, just as things work for taxi-drivers. However, it should be recognized that widespread unionization of local service providers could be against the interests of visitors, as it might encourage cartelization and price-fixing.

Suggestions for management of services by government employees

Members of the local administration are in favor of a complete ban on the use of plastic in the Kedarnath area. They also recommend the formation of a 'shrine board' which would exercise full regulatory powers over the entire areas. However, this is opposed by service providers as they fear that any such authority would curtail their property rights and commercial freedom.

Suggestions given by the researchers

1. The establishment of a shrine board in the study area is recommended to oversee the management and operation of services, thereby consolidating all committees and sub-committees under its purview.
2. The district administration and local communities should collaborate to launch initiatives that promote the development of sustainable alternatives to plastic products. This can be achieved by leveraging organic materials to create products such as bamboo bottles, rings, and khadi bags. Such efforts will not only enhance the value of local products but also generate employment opportunities for local populations, contributing to the region's economic growth and environmental conservation.

3. When assessing the carrying capacity of an eco-tourism site, it is crucial to consider that the daily number of visitors does not surpass the site's accommodation capacity. Furthermore, tourists should be discouraged from prolonged stays, as this can lead to accommodation shortages, prompting excessive construction, and subsequently, increased traffic, inflation, and environmental degradation, including pollution, at the site.
4. The absence of clear land ownership in the region can hinder the effective operation of eco-tourism, as it leads to an influx of service providers and an emphasis on profit maximization, often at the expense of ecological conservation. Consequently, local authorities face significant challenges in managing these areas.
5. The meadows within the study area are situated within the notified boundaries of the Kedarnath Wildlife Sanctuary. The excessive exploitation and misuse of natural resources disrupt the environmental equilibrium. Recognizing humans as an integral component of nature, it is essential to adopt a harmonious and symbiotic approach, ensuring the sustainable utilization of natural resources to maintain ecological balance.
6. It is recommended that helicopter services' operations be regulated to prevent them from deviating from their designated flight paths and flying perilously close to the mountains. This practice, driven by the desire to reduce costs and increase efficiency, results in noise pollution within the Kedarnath Wildlife Area and poses a significant threat to the sanctuary's fragile ecosystem, including its sensitive glaciers and wildlife populations, due to excessive air traffic.

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