



Tourism in the Himalayas: A Study of the Landscape of Mardi Himal Trekking Route, Kaski District, Nepal

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Abstract

This article examines how the tourism affects the natural environment and local people along the Mardi Himal Trek in Kaski District, Nepal. The research was based on surveys, GPS mapping, and interviews with 21 local people, including villagers, hotel owners, guides, and tourists. The findings show both advantages and problems related to the growth of tourism. Around 85% of participants said tourism was a key source of income, and 60% noted clear improvements in their household income and infrastructure. However, 70% also noticed changes in cultural behavior. Environmental issues like trail erosion, deforestation, and waste disposal are still serious. The trail varied scenery from forests to high mountain ridges and cultural features like prayer flags and village homestays continue to attract visitors from Nepal and abroad. As more people visit the area, careful planning is needed to protect its environment and culture, while also helping local people.

Keywords: *Landscape, trekking route, socio-ecological impact, sustainable tourism, Nepal Himalaya, Mardi Himal.*

Introduction

The Himalayas stretch about 3,500 kilometers from Afghanistan in the west to Yunnan province in China in the east. They are the highest and most impressive mountain range in the world (Ives et, 1997). They were formed during the Cenozoic period by the ongoing collision of the Indian and Eurasian tectonic plates. This mountain range includes major sub-regions like the Hindu Kush, Karakoram, the Indian and Nepalese Himalayas, and the Tibetan Plateau (Molnar & Tapponnier, 1975). The Greater Himalayan region spans many countries, including Afghanistan

(11.39%), Pakistan (11.79%), India (14.09%), Nepal (4.29%), Bhutan (1.12%), China including the Tibetan Autonomous Region (48.06%), and northern Myanmar (9.26%) (Singh et al., 2010). Besides its geological importance, this region has a wide range of altitudes, climates, and biodiversity (Xu et al., 2009).

The Himalayas are also the source of many of Asia's large rivers such as the Ganges, Brahmaputra, Indus, Mekong, Yangtze, and Yellow. These rivers support the lives of nearly 1.4 billion people who live downstream (ICIMOD, 2011). The region also includes earthquake-prone zones like the Hindu Kush and Pamir ranges (Kataoka et al., 2007).

Within this vast region, the Nepal Himalaya holds a special place. Although it covers just 4.3% of the Himalayan range, Nepal has eight of the world's fourteen peaks over 8,000 meters, including Sagarmatha (8,848.86 m) and Annapurna I (8,091 m) (NTB, 2022). This combination of high mountains, diverse cultures, and developed trekking paths has made Nepal a leading destination for mountain tourism (Stevens, 2003). Popular routes like the Everest Base Camp Trek, Annapurna Circuit, and the new Mardi Himal Trek attract thousands of trekkers each year, helping local economies and the national tourism industry (MoCTCA, 2020).

As tourism grows in the Nepal Himalaya, it is important to understand how it changes the landscape, affects the environment, and influences culture. This study focuses on understanding the natural and cultural features of the Mardi Himal trail and how tourism has affected the local environment and communities.

Materials and methods

Study area

The Mardi Himal Trek is located within the Annapurna Conservation Area (ACA), northeast of Pokhara, Kaski District, Nepal. The trail starts at Kande and passes through Forest Camp, Low Camp, and High Camp before reaching Mardi Base Camp, which is about 4,500 meters above sea level. This trek offers a short but varied experience of natural scenery, moving from warm, forested hills to high, open alpine meadows within a relatively small walking distance.

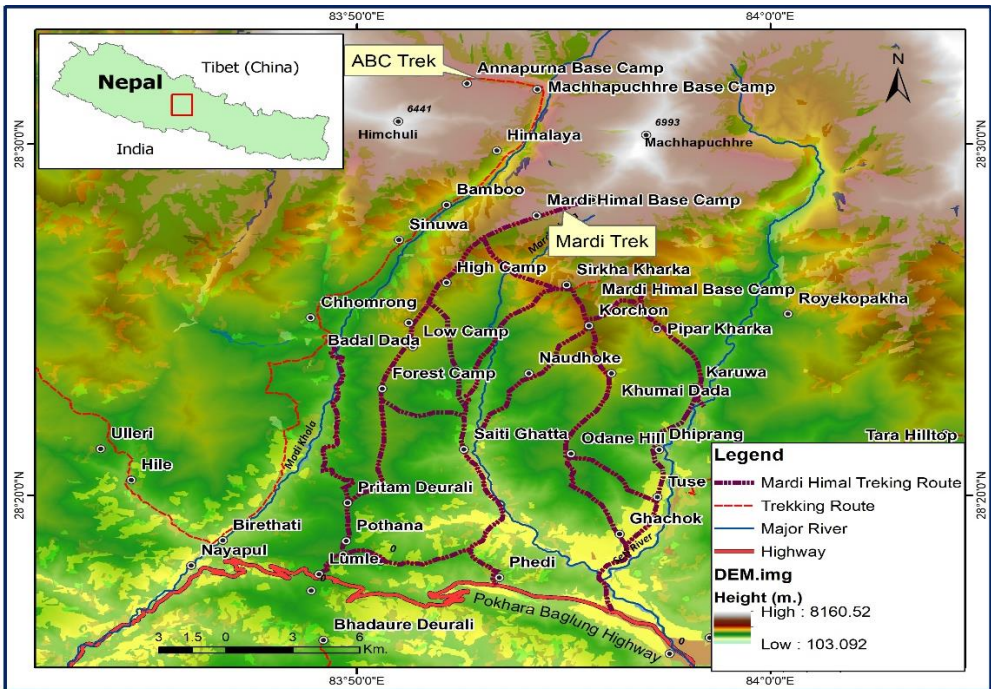
Landforms: The trail crosses different types of landforms, such as wooded hills, sharp ridgelines, stepped valleys used for farming, and snowy mountain peaks. Important geological features along the route include metamorphic rocks, glacial deposits (moraines), and weathered limestone cliffs.

Cultural Background: The area is mainly home to the Gurung community, but also includes people from other ethnic groups such as Brahmin, Chhetri, Magar,

Tamang, Damai, Kami, and Sarki. Many Gurung families follow Buddhism, while others along with most members of other groups mainly practice Hinduism.

Figure 1:

Location of Mardi Himal Trekking Route.



Source: Field visit -2022, Aster DEM Satellite Data & Department of Survey.

Sources of data

Primary data collection: To map ecological sections, movement of tourists and land use of the area, the present study involved field driven data collection and tracking of trails with the help of GPS. Key informant interviews, with local guides, teahouse managers and village leaders, were held to explore impacts of tourism, infrastructure development and local responses. Secondly, reference of the presences of flora and fauna, constructed infrastructures, noticeable variety of land use and overall status were visually observed along the Mardi Himal trail.

Secondary data sources: The study was supported with the secondary data collected from the various institutional sources among them are data and reports publications of Nepal Tourism Board (NTB), the ministry of culture, tourism and civil aviation (MoCTCA) and Annapurna Conservation Area (ACA). Detailed topographic/land use maps and very high-resolution satellite images were taken for terrain analysis and landscape identification. A comprehensive literature review was

also conducted in academic journals on the impacts of trekking and sustainable tourism in the Himalayas.

Analytical tools: For visualization of elevation patterns, ecological zones and settlement distributions, GIS mapping and terrain analysis were one of the main tools used. Layers of spatial data were superimposed to delineate path used. Throughout analysis, repeating views were derived from interview transcripts using thematic coding and triangulated with spatial and observational data to achieve analytical depth and consistency.

Data collection techniques

This research used extensive fieldwork and GPS tracking of segments of the trail to map ecological zones, tourist movement and land use. Interviews were also held with 21 individuals ranging from local residents, hoteliers, teahouse operators, trekking guides, and trekkers to explore the implications of tourism, infrastructure development, and community reactions. Field notes also were recorded on site, throughout the Mardi Himal trek to document the status of flora, fauna, man-made construction as well as open land and open land utilization.

This research applied a socio-physical approach in evaluating the spatial and tourism features of the Mardi Himal trail to understand its impact on tourism development. The researchers used fieldwork as their primary source, which included interviewing local guides and elders, drawing maps of land usage with GPS trackers on the trail, and assessing sections of the trail. Along with these activities, the researchers conducted semi-structured interviews with selected community members such as teahouse owners and local guides to collect quantitative data pertaining to tourism social trends. Participants from each section of the trail were recorded observing cultural, biological, and infrastructural constructs.

A variety of institutional repositories along with academic ones were used for secondary data collection. The Nepal Tourism Board NTB, MoCTCA ,and ACA provided baseline statistics along with management plans for tourism in Nepal. The researchers also gathered topographic maps alongside GIS data and iso satellites to assess land use alterations alongside elevation profiles. This was further supplemented by conducting literature reviews of previous hiking studies carried out in the Himalayas. In combination all, this data created a holistic approach that could provide elbowroom for fresh methodologies beyond just contextual boundaries. For geospatial data, geographic information systems (GIS) was used for landscape characterization analyses spatially comparing area.

Results and discussion

Landscape features and scenic views

The Mardi Himal landscape, shaped by both natural forces and tourism infrastructure, reflects dynamic spatial layering and ecological richness. Visual and physical experiences in the trek such as Mardi Himal are connected to their elevation zoning as well as land use transition (Nepal 2015). The trail showcases a range of environmental impressions from closed forests to extensive open alpine ridges which influence visitors' perceptions of the landscape. Besides aesthetics, these impressions also inform trekkers' comfort, risk tolerance, level of satisfaction experienced during trekking (Nepal 2015).

The Mardi Himal trail is one of the best examples of an altitudinal transect in Nepal. It starts from Kande (~1770 m) and/or Ghatte khola near Phedi which mid-way through lush green hilly forests and finally opens up to granite and alpine scenery. Within that frame, you are passing through different ecological and climatic zones culminating with the Mardi Himal Base Camp around 4600 meters. There are four major points of entry in Mardi Himal Trekking Route i.e. Kande, Ghatte khola and Dhampus, Kalimati and Sidane. Most preferred entry is Kande along the Australian Camp to Pothana where it pleasantly follows a ridge line showering wonderful views over the mountain peaks, hilly ranges draped in green vegetation, and meandering river valleys below. Ghatte Khola, Dhampus is more suitable as an entry route for the acclimatization of new trekkers coming from lowland plains. Sidane and Kalimati are shorter routes that can be taken by people who have limited time, however these routes offer less scenic beauty.

According to the analysis of altitudinal maps, the following elevation zones have been identified along with their respective trekking ranges:

- 1. Below 1500m:** Present towards the southern edges such as Dhampus Phedi and Mardi Himal. This zone contains subtropical river valleys characterized by terrace farming along with road access.
- 2. 1500 – 2500 m:** Includes Australian Camp and Pothana which were visited by tourists previously around Kande, Forest Camp, and lower sections of Temple Found Kande gravitating toward nobler shrubby regions emerging into open pastures filled with Rhododendron Trees, Alder, and Oak Besides long Austrailian camp Oak foreats towards south west composes tepearate broad leaf trees These sre rich region also becomes diversified flora life

3. 2500 - 3500m: While some came up during summers escaping ultra cold seasons while in extreme winters visiting 'The Badal Dada'- a gradual steep middle hills pass Low camp further hosted thick Bamboo woods covered in dense foamy like shrink like trees holding different shapes facing dimmer surroundings

4. 3500-4500m: This upper zone encompasses High Camp and Mardi Himal Base Camp along with adjacent alpine areas. The vegetation turns into subalpine scrub along with open grasslands with little plant cover. Here, you can get stunning glimpses of Machhapuchhre (6993m) and Annapurna South (7219m).

5. 4,500m and Above: While this zone is not part of the itinerary for the Mardi Trek, it can be seen in the adjacent high ridges and glacier areas. It encompasses Himalayan peaks along with snow-covered expanses.

It appears that the entire altitude map validates my assertion that there is a significant variety of nature within a short distance on the Mardi Himal trail. The prominent look-out sited like High Camp, Sirkha Kharka, and even Mardi Himal Base Camp are found at higher elevations which guarantee clear sight of snow-capped peaks. Trekkers will appreciate breathtaking panoramas coupled with enchanting sunsets and sunrises set against tranquil nature, timeless serenity, and mountains. The memories get etched in the heart forever alongside their photographs portraying pristine beauty.

Figure 2

Topography of Mardi Himal trekking route with Machhapuchhre (Photo by author)



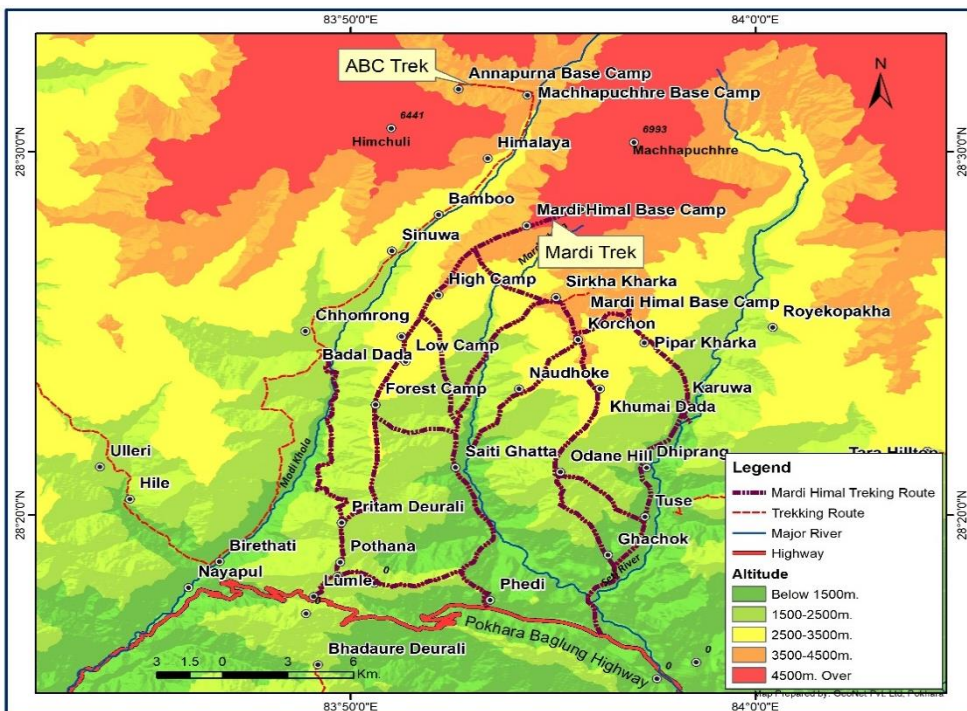
The elevation changes add to the visual appeal of this trek. In the lower portions, one can view green forests and waterfalls while higher sections reveal tall cliffs, glaciers and an open sky. This gradual change gives Mardi Himal Trek a rich experience, especially for those seeking to appreciate nature's beauty in a short trekking duration.

Glacial features on Mardi Himal

In the uppermost areas of Mardi Himal, some very important glacial features also exist. Small glaciers are located on the northern slopes of the mountain, which contain vital water resources despite many years of shrinking due to climate change. There are also permanent snowfields above 4500 meters that serve as natural water reservoirs. These fields slowly melt during off seasons providing steady amounts of water in summer.

Figure 3

Altitudinal Map and Mardi Trekking Route



Source: Field visit -2022, Aster DEM Satellite Data & Department of Survey.

Apart from these regions containing constant snow and ice cover boundaries, there is evidence indicating former glacial activities that shaped our planet centuries ago which greatly fascinate trekkers such as U-shaped valleys and bowl-shaped

landforms known as cirques around base camp these were where historic glaciers used to be and are now crucial in preserving moisture supporting plants, animals from the area. The presence of these glacial elements adds to the environmental value of the Mardi Himal trail and highlights the need for ongoing monitoring and conservation.

Cultural landmarks

The Mardi Himal trek offers a rich cultural experience; presenting both spiritual and vernacular architecture. As hikers and trekkers travel up the trail, one will come across sacred cultural signposts such as Mani walls, Chortens and Prayer flags that stand against the dramatic, high Himalayan mountain silhouette. These help to focus the mind on a Buddhist theme and give the trail a more spiritual feel.

One striking example is seen in the photo above, taken on our way up to Mardi Himal Base Camp. The photograph shows the Mani buildings made of stones with vertical prayers flags on their long walls, in front of the giant snow capped ridges. Such defensive humanitarian structures are frequently constructed by local communities as acts of devotion and defense, inviting travellers to ponder and interact with the community's Creator.

Figure 4

Mani structure and prayer flags along the Mardi Himal trail (Photo by author)



Villages like Siding and Lwang are cultural way stations where you can get an experience of the trail's social mélange, with local food and homestays and Gurung

music and dance. Such settlements have experienced a low-key cultural revival as a result of tourism, where the traditional pagan rituals and crafts are revalued for visiting strangers.

Furthermore, Tourism has galvanised a developing pride in conservation of the heritage. Stone masonry employed in the chortens and mani walls is being preserved, along with traditional hospitality customs, including presenting a khada (a ceremonial scarf) are still widely followed.

Tourism trends and development

Mardi Himal has begun to receive appreciable tourist interest since 2012. Its short trek typically 4 to 7 days has appealed to time-scarce foreign visitors. Growing popularity has stimulated growing numbers of teahouses and service stations, more employment opportunities for locals as guides, porters, and entrepreneurs, better trail conditions and emergency response systems. The trail contributes significantly to local household incomes, especially during high season (March–May, October–November), although dependence on tourism has subjected some households to seasonality. To place this local development within the broader regional context, Table 1 presents a 17 year tourist arrival record for Nepal, Pokhara, and the Annapurna Conservation Area (ACA).

The figures indicate a sharp decline of international visitors during 2020–2021 due to the COVID-19 pandemic. However, 2024 has been a record year of ACA tourism with over 244,000 tourists, an equivalent 71.43% of those who visited Pokhara. This grand boom is not only due to global travel recuperation but also due to flourishing domestic tourism by young Nepali tourists in pursuit of recreation and adventure. The trends point to the growing importance of ACA and thus trails like Mardi Himal as key areas to cultivate ecotourism.

Similarly, Pokhara accounts for a major proportion of Nepal's tourism services and facilities. Despite generating nearly 39% of the country's total international arrivals, Pokhara attracts only 21.2% of the total tourism income (MoCTCA, 2020; NTB, 2020; MoITFE, 2077). The disparity may be attributed to relatively lower average tourist stay of 3.2 days compared to the country's average stay of 12 days, reflecting the need for higher stays and diversified products of tourism.

Table 1:

Trend of Tourism Arrival in Annapurna Conservation Area (ACA)

Year	Tourists in Nepal	Growth (%)	Tourists in Pokhara	Tourists in ACA	Visitors in ACA (%)
2008	500,277	-	186,643	72,175	38.67
2009	509,956	1.9	203,527	79,896	39.26
2010	602,867	18.3	230,799	90,161	39.06
2011	736,215	44.37	283,442	101,908	35.95
2012	803,092	9.08	309,190	106,499	34.44
2013	797,616	-0.68	307,082	116,120	37.81
2014	790,118	-0.94	304,195	129,624	42.61
2015	538,970	-31.79	207,503	78,930	38.04
2016	753,002	39.71	289,905	114,507	39.50
2017	940,218	24.86	361,983	159,560	44.08
2018	1,173,072	24.77	451,632	172,720	38.24
2019	1,197,191	2.06	460,918	181,746	39.43
2020	230,985	-80.78	88,582	18,796	21.22
2021	150,962	-34.3	58,120	5,122	8.81
2022	614,869	307.3	236,725	7,094	3.00
2023	1,014,882	65.05	390,730	116,293	29.76
2024	1,147,567	13.15	341,663	244,045	71.43

Source: Nepal Tourism Board, MoCTCA, ACA, and Republica (2024)

Investment in Pokhara's tourism sector is strong, totaling Rs 500 billion nearly a third of national tourism investments. With 15,642 accommodation beds and a 52% average occupancy rate, the city has a developed yet scalable lodging infrastructure. Additionally, Pokhara hosts a significant proportion of Nepal's tourist hotels (43.8%) and homestay villages (9%), which are crucial for integrating local communities into tourism development (MoITFE, 2077).

Figure 4

Data collection with field observation in High Camp, Mardi Himal Trekking route (Photo by author, October 2022).



These data points reinforce Pokhara's status as a tourism nucleus and validate its proximity to treks like Mardi Himal as both a logistical advantage and a strategic opportunity for the Gandaki Province development.

Socio-ecological implications

Mardi Himal's impact of tourism is representative of broader socio-ecological pressures seen in other regions of the Himalayas. According to Nepal (2015), the uncontrolled growth of tourism infrastructure such as teahouses and access trails has been held to complicate landscape degradation, resource overuse, and community disruption. This is true also for Mardi Himal, with increasing visitor numbers being entwined with increasing pressures upon trails, forests, and water resources. Community-led tourism can provide resilience, but only if it combines environmental sensitivity with bottom-up governance in the long term (Nepal, 2015).

To better understand these dynamics, interviews were conducted with 21 local respondents including hoteliers, teahouse owners, trekking guides, and trekkers. Their insights provided a grounded view of tourism's effects on both social and ecological dimensions.

Social Impacts: During the interviews, 85% of the respondents viewed income from trekking and tourism as a positive gain. Moreover, 60% reported that overall income had substantially increased. One of the major indicators of this economic growth is observable in the physical transformation that has occurred

in the local residence: 65% of the respondents reported that houses had shifted from small, traditional, thatched (khar) roofed houses to bigger galvanized tin roofed houses. However, this material progress came with cultural expenses. About 70% of the respondents expressed concern about altering cultural customs, including lower rates of attending traditional rites and lifestyles outside.

Environmental (Ecological) Implications: Ecologically, the majority of the respondents pointed out recurring issues such as erosion of trails, forest logging, and cutting of firewood. Forest degradation is also a big concern, primarily due to the use of wood as fuel in expanding teahouses. Other disturbances in livestock trails and wildlife habitats were cited. Waste and litter, particularly plastic, have also grown with more trekking. A few of the participants attributed these shifts in the environment to broader patterns of climate change, including the retreat of small glaciers and shifts in local weather.

These findings are consistent with ground realities in Nepal, validating the need for an equilibrium model that protects the natural systems and supports tourism-based development. Only through people's rights and sustainable policies is Mardi Himal a sustainable and respectful destination for future generations.

Challenges, opportunities, and future prospects

The Mardi Himal trail is of great potential as a model for low-impact trekking in Nepal. It offers natural beauty, managed visitor flow, and healthy local involvement. These are ideal circumstances for selling sustainable tourism before there can be problems of any real magnitude.

However, problems are arising. The larger number of people arriving, the larger number of problems such as unregulated construction, trail deterioration, forest use, and trash are occurring. The major problem is lack of water supply. During dry season times local hotel owners transport water from downstream in mules. But during wet season times they are usually collecting rainwater through roof pipe to plastic drums. Because of the shortage of water, health and sanitation is the greatest challenge. Bottled-water made of plastics is consumed by most of the trekkers for drinking which form the largest proportion of solid waste on the trail. No waste management was seen on the trail and even at the hotels. Interviews and observation in the field show that cultural change and resource pressure already exist. If left unattended, Mardi Himal could suffer the same issues as other more highly trafficked trails.

There are real opportunities, though. Community organizations can handle tourism well if properly assisted by local and provincial governments. Training,

funding, and engagement in planning will ensure proper local management. Nature and culture conservation may be enhanced through visitor education and stricter permit regimes. Climate adaptation should be incorporated into future plans.

With cooperative endeavors from conservation societies, tourism authorities, and local communities, Mardi Himal may evolve in a way that its heritage and landscape are maintained. One of its strongest points is that it is accessible. The trek to Mardi Himal is short, scenic, and possible for most tourists with an average duration of only three to four days for indigenous locals and four to seven days for outsiders. This allows trekkers to view different types of landscapes within a limited time and return easily to Pokhara Nepal's tourism hub without requiring lengthy travel or lengthy time commitments.

Conclusion

This study presents results based on both secondary data and field research in an attempt to examine how the environment and local communities are affected by tourism on the Mardi Himal Trekking Trail. The results show that the varied elevation and beautiful landscape from green hills to alpine meadows and glacial fields of the trail are key reasons why it is popular. These natural features are interspersed with cultural sites such as traditional villages, chortens, mani, walls, and prayer flags, giving a substantial and diverse trekking experience.

Empirical experience suggests that the trail's altitudinal diversity and scenery variety within short travel time from subtropical forests to alpine ridges and glacial terrain provide a strongly interactive environment for trekkers. These physical features are complemented by vibrant cultural landmarks. The statistics also reflect strong tourism growth in the Annapurna region, particularly in the last couple of years, with Mardi Himal benefiting from its short period, easiness, and proximity to Pokhara. Quantitative records show robust ACA visitor recovery in 2024, underpinned by improved infrastructure and growing local appeal.

Survey results also reveal that 85% of the local interviewees perceive tourism as a benign source of revenue, with significant upgrading of housing and service facilities. But things to be fixed still remain: 70% of the interviewees referred to changes in culture, and most targeted environmental issues such as forest destruction, trail erosion, and lack of adequate disposal of refuse. They underscore the need for more integrated and locally oriented planning. Mardi Himal trek both embodies the potential and problems of Himalayan tourism. Its growing popularity will have to be counterbalanced by thoughtful strategies that preserve its ecological and cultural soundness along with the well-being of its local people.

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