
Future of Ecotourism in the Valley of Flowers National Park: A Case Study of Garhwal Himalaya, India

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Abstract: This paper reports the future of Ecotourism in the valley of flowers national park in Garhwal Himalaya, Uttarakhand India. The valley has an unusually rich flora of over 600 species with many rarities. Animals found are nationally rare or endangered. 13 species of mammals are recorded for the Park and its vicinity although only 9 species have been sighted directly. Other factors that are contributing to ecotourism are beautiful landscapes, peaks, lakes and tarns etc. But now-a-days the problem of Solid waste is increasing at an alarming rate because of the heavy influx of tourists and improper management practices.

1. Introduction

Ecotourism has been developed following the environmental movement which appeared at the beginning of the seventies. The growing interest of people for environment and trips oriented towards fresh air, in addition to the growing dissatisfaction towards mass tourism, highlighted to the tourism industry a need for ecotourism. Besides, the understanding and the agreement with the principles of nature preservation and durability for a growing portion of the population took part in the evolution of the term "**ecotourism**".

Ecotourism is often considered as a form of tourism with "a strong motivation". There is no universal definition for ecotourism. It is usually considered as a "tourism favorable to the environment", which is, on a practical level, variously interpreted according to the country.

In the absence of a clear and recognized definition, the definition for the International Society for Eco-Tourism (1991) is: "... a responsible tourism in natural environment which preserves it and participates to the well-being of local populations".

According to the World Conservation Union (1996), it can be defined as "... the visit of natural environments remained relatively intact... with a low

negative impact... including a socio-economical implication for the local populations which is at the same time active and beneficial".

Characteristics of Ecotourism

Although it is difficult to define **ecotourism**, it presents several characteristics:

- the destination is generally a natural environment which is not polluted;
- its attractions are its flora and its wildlife, and more generally its bio-diversity;
- ecotourism must support the local economy and the specificity of the place;
- it must contribute to the preservation of the environment, and more generally, promote the preservation of nature;
- eco-tourist stays often include an educational aspect.

In the last twenty years India has opened its door to the international tourists and is now fostering tourism largely to gain an increase in the foreign earnings to help its economy. Majority of the tourists are involved with nature tourism as India has lot of potential for this form of tourism. Garhwal Himalaya presents an example where tourism reached some of the most sensitive ecosystem of the high Himalayan region unprepared and unguarded. The region offers

dramatic mountain scenery to be imagined anywhere on the earth that mountaineers would never be tired of singing its praise (Fukuda, 1971). The result is obviously, for more eco-negatives and few eco-positives (Kaur, 1977).

Valley of Flowers (VOF) National Park nearby protects one of the most beautiful mountain wildernesses of the Western Himalayas, celebrated for its meadows of endemic alpine flowers where more than 600 Himalayan species grow in an area of less than 2,500 hectares. It is also the habitat of the endangered snow leopard, Asiatic black bear, and brown bear, Himalayan musk deer and bharal. Together, the parks preserve a transition zone between the eastern and western Himalayan flora, the Zaskar mountains and the Great Himalayas, long praised in Hindu mythology and for over a century by botanists and mountaineers (UNEP Report). Marked by difficult geographic terrain and hard accessibility the region has long enjoyed self-sufficiency, which was supplemented by beneficial pilgrim economy (Pauw, 1986). The biological significance of VOF lies in its exquisite floral and faunal biodiversity with myriads of alluring flowers.

2. The Study area

The VOF National Park (87.50 sq. km.; lat $30^{\circ} 41' - 30^{\circ} 48' N$ and long $79^{\circ} 33' - 79^{\circ} 46' E$) is located in Chamoli Garhwal, about 595 km northeast of Delhi (capital of India) in the state of Uttarakhand. Its altitude ranges from 3,200 m asl to 6,675m asl. (Figure 1). The VOF has a highly heterogeneous landscape, ranging from low lying flat and gentle slopes to steep slopes, unstable glacial moraines, stream banks, forest meadow edges and snow bound areas. Such a geomorphological heterogeneity has resulted in a rich diversity of flowering plants, which attracts a number of botanists and tourists across the world (Kala, 2005).

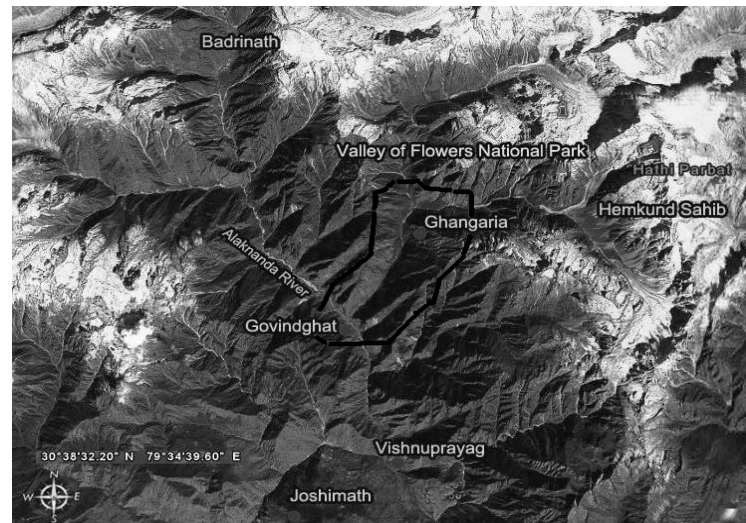


Figure 1. Study site

Climate

Climate is of particular significance to tourism. In fact, tourist market of hills depends on climate. The month of May and June attracts maximum number of tourists and pilgrims to the region whereas the number starts to decline in the month of July. This increase and decrease in the number of tourists can be attributed to weather and climatic changes in the region. The area under investigation is varied in climate. Conditions are generally dry with low annual precipitation, but there is heavy monsoon rainfall from late June to early September. Prevailing mist and low cloud during the monsoon keeps the soil moist, hence the vegetation is lusher than is usual in the drier inner Himalayan valleys. From mid April to June temperatures are moderate to cool ($19^{\circ}C$ maximum). The Valley of Flowers also has the microclimate of an enclosed inner Himalayan valley, and is shielded from the full impact of the southwest summer monsoon by the Greater Himalaya range to its south. There is often dense fog and rain especially during the late summer monsoon. Both Basin and Valley are usually snow-bound for six to seven months between late October and late March, the snow accumulating deeper and at lower altitudes on the shadowed southern than on the northern side of the valleys (Lavkumar, 1979; Lamba, 1987). Altitudinally the area can be divided into the following climatic zones viz,

- Warm up to 1300m asl
- Temperate 1300-2100m asl
- Cold 2100-3030m asl
- Glacial above 3400m asl.

3. Potential Ecotourism Resources of the area

a. Flora

The Valley of Flowers National Park can be divided into three broad eco-climatic zones viz. sub alpine (2800-3500 m asl.). Lower alpine (3500-3700 m asl.) and higher alpine (3700m asl.). The valley has an unusually rich flora of over 600 species with many rarities. These comprise 25% of the vascular plants found in the Chamoli district though the valley is only 1.3% of its area. The habitats include valley bottom, river bed, small forests, meadows, eroded, scrubby and stable slopes, moraine, plateau, bogs, stone desert and caves. The lower surrounding hills in the buffer zone are thickly forested. The Forest Research Institute in 1992 recorded 600 species of angiosperms and 30 pteridophytes in the valley and surroundings, discovering 58 new records for the valley of which 4 were new for Himalayan Uttar Pradesh. Of these plants, 5 out of 6 species globally threatened are not found in Nanda Devi National Park or elsewhere in Uttaranchal: *Aconitum falconeri*, *A. balfourii*, Himalayan maple *Acer caesium*, the blue Himalayan poppy *Mecanopsis aculeate* and *Saussurea atkinsonii* (Green & Peard, 2005). 31 species are classified as nationally rare. The dominant family is the Asteraceae with 62 species. 45 medicinal plants are used by local villagers and several species, such as *Saussurea obvallata* (Brahmakamal) are collected as religious offerings to Nanda Devi and other deities. The site is designated a Centre of Plant Diversity. Characteristic of the sub-alpine zone are high altitude forests which help to retain moisture and snow and support a large number of floral and faunal communities. It is dominated by the uncommon Himalayan maple *Acer caesium*, west Himalayan fir *Abies pindrow*, Himalayan white birch *Betula utilis*, and *Rhododendron campanulatum* with Himalayan yew *Taxus wallichiana*, *Syringa emodi* and *Sorbus lanata*. Some of the common herbs are *Arisaema jacquemontii*, *Boschniakia himalaica*, *Corydalis cashmeriana*, *Polemonium caeruleum*, *Polygonum polystachyum* (a rampant tall weed), *Impatiens sulcata*, *Geranium wallichianum*, *Helinia elliptica*, *Galium aparine*, *Morina longifolia*, *Inula*

grandiflora, *Nomochoris oxypetala*, *Anemone rivularis*, *Pedicularis pectinata*, *P. bicornuta*, *Primula denticulate* and *Trillidium govianum*. In trampled areas where past livestock congregated, Himalayan knotweed *Polygonum polystachyum* is a rampant weed.

The Valley's lower alpine zone has greater moisture and deeper soil. A large number of herbaceous communities grow in great profusion and it supports the greatest diversity of alpine plants. Characteristic of the zone are dwarf shrubs, cushion herbs, grasses and sedges. Common and singleseed junipers *Juniperus communis* and *J. squamata*, *Rhododendron anthopogon*, *Salix spp.*, *Lonicera myrtillus*, *Cotoneaster microphyllus*, and *Rubus ellipticus* are the major shrub species in this zone. The herbaceous flora gives a spectacular multicoloured array of flowers during the growing season. Their growth cycle is very short, and they give way to other communities later in the season. The dominant herbs of this zone are *Potentilla atrosanguinea*, *Geranium wallichianum*, *Fritillaria roylei*, *Impatiens sulcata*, *Polygonum polystachyum*, *Angelica archangelica*, *Selinum vaginatum*. The common grasses of the zone are *Danthonia cachemyriana*, *Calamagrostis emodensis*, *Agrostis pilosula* and *Trisetum spicatum*; the main sedge species are *Kobresia roylei* and *Carex nubigena*.

The higher alpine zone is an area of pioneer species dispersed among moraines, boulders, and rocky slopes, dominated by scattered and stunted herbs with delicate flowers, mosses and lichens. On northern aspects and in sheltered areas are extensive shrubby patches of *Rhododendron lepidotum*, *Cassiope fastigiata* and *Juniperus communis*. The zone's dominant species are *Kobresia royleana*, *Trachydium roylei* and *Danthonia cachemyriana*. There are also several colourful herbs like *Saussurea simpsoniana*, *Potentilla argyrophylla*, *Geum elatum*, *Senecio spp.*, *Bistorta affinis*, *Bergenia stracheyi* and the flagship species blue Himalayan poppy *Mecanopsis aculeate* (UNEP World Conservation Monitoring center 2005).

b. Fauna

Animals found are nationally rare or endangered. 13 species of mammals are recorded for the Park and its vicinity although only 9 species have been sighted directly: common langur *Presbytes entellus*, flying squirrel *Petaurista petaurista*, Himalayan black bear

Selenarctos thibetanus (VU), red fox *Vulpes vulpes*, Himalayan weasel *Mustela sibirica*, and Himalayan yellow marten *Martes flavigula*, goral *Naemorhedus goral*, Himalayan musk deer *Moschus chrysogaste*, Indian mouse deer *Moschiola meminna*, Himalayan thar *Hemitragus jemlahicus* (VU) and serow *Capricornis sumatrensis* (VU). The tahr is common, the serow, goral, musk deer and bharal, blue sheep are rare. The common leopard *Panthera pardus* is reported from lower parts of the valley closer to the villages. Local people have also reported evidence of Himalayan brown bear *Ursus arctos* and bharal or blue sheep *Pseudois nayaur*. A recent faunal survey in October 2004 has established the presence of snow leopard *Uncia uncia* (EN) in the National Park.

The area is within the West Himalayan Endemic Bird Area but there have been no surveys specific to the Valley. 114 species were seen in 1993 in Nanda Devi Park. Species frequently seen in the valley include lammergeier *Gypaetus barbatus*, Himalayan griffon *Gyps himalayensis*, yellow billed and red billed choughs *Pyrhacorax graculus* and *P. pyrhorcorax*, koklass pheasant *Pucrasia macrolopha*, the nationally listed monal pheasant *Lophophorus impejanus*, found in rhododendron thickets, scaly-bellied woodpecker *Picus squamatus*, greater yellow naped woodpecker *P. flavinucha*, great barbet *Megalaima virens*, blue throated barbet *M. asiatica*, snow pigeon *Columba leuconota* and spotted dove *Streptopelia chinensis*. The area is relatively poor in reptiles: most often seen are the high altitude lizard *Agama tuberculata*, Himalayan ground skink *Leiopisma himalayana* and Himalayan pit viper *Gloydius himalayanus*. Along with the flowers are wild bees and many species of butterfly which need to be more researched. A few of the more evident species are lime butterfly *Papilio demoleus demoleus*, common yellow swallowtail *Papilio machaon*, common mormon *Papilio polytes romulus*, spangle *Papilio protenor protenor* and common blue apollo *Parnassius hardwickei*. (UNEP World Conservation Monitoring center 2005).

c. Cultural Heritage

The Valley of Flowers 07 kms south of the park entrance, at Ghangrea, a track leads off to the Hemkund Sahib shrine sacred to Sikhs, and the Hindu temple to Lord Lakshman, (brother of Lord Rama), beside Lake Lokpal. About 400,000-500,000

pilgrims visit them every year. (UNEP World Conservation Monitoring center 2005).

Faith Scapes (Pilgrimage)

The faith scapes of the region are discussed below:

- Panch Badri
- Shri Badrinath
- Yogadhyan Badri
- Briddha badri
- Adi Badri

Social attractions/Interests

- Mana, etc

d. Landscape and Peaks

An attractive landscape is an asset on which mountain tourism depends. It can be stated that mountains are the foundations of the tourism industry. The entire study area is mountainous. The rugged landmass is thoroughly and artistically punctuated with natures superlatives. Mountains any where in the world, with their pronounced sculpturing carry greater aesthetic appeal than low relieved land forms. Here landscapes are most enchanting. The actual attraction is the towering snow covered peaks that makes the scenery challenging and beautiful to adventurers. The chains of the high mountain peaks are divided into different mountain groups by the mighty rivers of Garhwal. The high peak of Bunderpunch (6302m asl), Kalanag (6387m asl) lie between the tons and Bhagirathi rivers, Matri (6721 m asl), Chirbas (6525m asl), Trimukh Parvat (6422m asl) lie between Jadh ganga and the Bhagirathi rivers.

Another cluster of peaks lie between Bhagirathi and Saraswati river. Famous among the peaks are Chaukhamba situated on the west of Badribath temple, Neelkanth (6600 m asl) and the Sameru Parvat (6350m asl).

e. Glaciers

There are numerous glaciers in the area. Valleys between 2000m asl and 3000m asl show the glacial feature wherever knot blot out by fluvial action. Some of the glaciers, which need mention at this point, are:

- Doonagiri Glacier
- Tiprabamak Glacier
- Satopanth, Bhagirathi-Khark Glacier.

f. Water systems

It consists of rivers, Streams, Tarnns and Torrents. The rivers are running deep into the gorges from where it cannot be utilized for the purpose of irrigation. The main rivers are:

- Alaknanda
- Saraswati
- Dhauri Ganga

g. Lakes and Tarns

Upper Garhwal Himalaya is famous for its tranquil tarns, which are found around 3000m asl. The landslide and heaps of debris, partly blocking the rivers or streams forms most of these tarns, though some are fed by the underground sources. Plugging of valley by moraines deposited by ancient glaciers forms most glacial lakes. Mostly, they are sweet water lakes but few are brine water too. Unfortunately, some of the lakes have dried due to improper management practices like Ghona Lake in Chamoli district is the latest example of such happening. This lake came into existence near Ghona village on 06th august 1893 with a huge landslide-blocking river Birahi Ganga. In 1930 forest department released some trout fishes and soon it became angler's paradise. But the cloudburst of 22nd July 1970 made the lake to overflow and break the wall of one side, resulting in devastating flood. Suddenly on 26th July 1970 the lake disappeared.

Some of the Tals of the area are:

- Hemkund Lokpal
- Satopanth
- Vasundhara fall
- Deotal
- Roopkund
- Vednikund.

4. Conservation value

The Valley is one of the two core zones of the Nanda Devi Biosphere Reserve which protects one of the most spectacular mountain wildernesses of the western Himalayas, among which the Paspawati valley is celebrated for its flowers. More than 500 species grow there in an area of less than 2,500 hectares. It is also the habitat of the endangered snow leopard and Himalayan musk deer. The whole area lies within a Conservation International-designated Conservation Hotspot, in a WWF Global 200 Eco-region, is in a WWF/IUCN Centre of Plant Diversity and in one of the world's Endemic Bird Areas. It is also a UNESCO Biosphere Reserve.

5. Need for Conservation

The Park is a natural laboratory for the conservation and study of the western Himalayan flora. In 2002-03 in cooperation with the villagers' Eco-Development Committee and Forest Committee of Bhyundar the Forestry Department oversaw the clearing of 50 tons of litter and removed 120 temporary stalls from the pilgrim trail from Govindhar to Hekmund. The Committee is also spreading awareness of the need to suppress the rampant Himalayan knotweed. Management is done within the 2003-2013 plan for Nanda Devi Biosphere Reserve which is implemented annually in consultation with local, district and state bodies but does not manage the parks directly.

6. Management constraints

The main management issues are control of invasive knotweed within the Valley, and, on the way to it, tourist and pilgrim litter. Some 1,000 ha of meadow are infested with the tall fast growing Himalayan knotweed which controls erosion but crowds out and smothers the subalpine flora. Its increase where livestock used to congregate is related to the prohibition of grazing. While livestock overgraze and over-enrich the soil, they may enhance floral diversity by limiting the growth of taller more vigorous plants. Its eradication and regular monitoring is expected to be a major expense (Srivastava, 1999). The litter piles up by the tonne from the thousands of tourists that visit the shrines: 300,000 plastic bottles a year and 5-600 kg of human and mule dung per day. The local people have now

combined to clear this. A past threat to the forests surrounding the pilgrim route was the destruction of trees for firewood but this is now forbidden. There is no pollution and little danger from avalanches except on the approach road from Govindghat. There is, nevertheless, a constant threat from local poachers, especially to the snow leopard, and to ungulates when they come down to the valleys in winter; also from local indifference to wildlife conservation. This is aggravated by lack of adequate funding for the training needed for high altitude monitoring.

7. Conclusion

Valley of Flowers is known for its pristine beauty. Tourism has emerged in form of industry today for generating revenue. The number of tourists visiting Valley is increasing every season. Ecotourism in VOF should be promoted in such a way that it should not destroy the beauty of natural ecosystem. Community participation has a key role to play in spreading awareness among the local villagers, tourists, etc for having a sustainable form of ecotourism.

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