

## **BUILDING A MODEL PLAN FOR BIODIVERSITY CONSERVATION AND SOCIO ECONOMIC DEVELOPMENT OF THE PEOPLE IN THE BUFFER ZONE OF THE VALLEY OF THE FLOWERS NATIONAL PARK BASED ON SUSTAINABLE ECO-TOURISM**

**Mohinder Singh Kunwar**

*Himalayan Action Research Centre, 744, Indra Nagar, Phase-II, P.O. New Forest, Dehradun, Uttarakhand*

Study pertaining the management of grasslands in the valley of flowers National Park Garhwal Himalaya was conducted during 1997. The objective of the study was to evolve a model plan for bio-diversity conservation and Socio-economic development of the people living in the vicinity (buffer zone) of parks and sanctuaries based on sustainable eco-tourism.

The valley of flowers (87.50 km<sup>2</sup> 30° 48' N and 79° 33' 79° 46' F) National Park can be divided into three broad eco-climatic zones viz. sub alpine (2800-3500 mt.). Lower alpine (3500-3700 mt.) and higher alpine (3700mt.) In each stratified zone random quadrates of 50x50 cm. were laid to quantify the vegetation parameters i.e. species diversity, richness, evenness, density and frequency. A total of 520 species of plants including 498 Angiosperms, 4 Gymnosperms and 18 Pteridophytes were recorded within the Valley of flowers. The ratios of monocot and dicot families, genera and species were 1:4.1, 1:3.5 and 1:4.3 respectively.

The new records were added to the existing list of plants viz. *Saussurea att*, *Duthiea bremoides*, *Lycopodium Selago*, *Salix Calyculata* and *Pimpinella hookerie*. Although the valley of flowers constitutes 1.3% of the total geographical area of the Chamoli district, yet it contributes 25% of the total flora. People's perception shows that species diversity is decreased in the valley of flowers. In the absence of quantitative data from the past studies it is not possible to infer whether species diversity has increased or decreased after the declaration of the park and resultant ban on livestock grazing since 1982. However, visual observations shows that the density of rare herbs such as *Polemonium caeruleum*, *Cypridium Himalayan*, *Dactylorrhiza hatagirea* *Herminium jesepe*, *Companula latifelra* etc. (where as density of *Polygonium* and *Osmurda* has also increased in the valley of flowers National Park) have increased since the declaration of the valley as National Park.

Out of 31 rare and endangered plant species including 11 species listed in the Red Data Book (RDB) of the Indian plants recorded within the Valley of Flowers National Park, only 10 species appeared in the sample plots. *Aconitum heterophyllum* reported by earlier workers was not found during the present investigators. Most of the rare species were found in unusual microhabitat e.g. rocky slopes, forest edges. These species are rare because of restricted habitats, small population size range of distribution and over exploitation by man for the medicinal uses in the past. At present Brahma Kamal is experiencing a great pressure because of its use in worship in temples, so it has become endangered.

*Polygonium polystachym* (enemy of flowers), a fast growing herb was mostly found in presently eroded slopes, past camping sites, river bands and avalanches traps both within and outside of the park <3800 m asl. This herb has been eradicated from this area by *Impatiens sulcate* mixed herb community. The number of species present within polygonium polyspohepatches with microclimatic conditions and altitudes. Past camping sites had test number of species (25 per stand) compared to other areas (39-42 per stand) within the same elevation range.

Considering the existing pattern of floristic distribution, its compositional behavior and declining trend in floristic diversity, long term conservation of floral diversity in the Valley of Flowers National park needs to be carried out in the following manners.

1. Identification and restoration of rare plants and their habitat.
2. Recovering and rehabilitation program in the outer fringes of the park.
3. Monitoring of areas which are dominated by tall and fast growing herbs.
4. Ecological research on threatened species.
5. Effective implementation of existing forest conservation Act and peoples participation in conservation of the area.
6. Development of nature interpretation and guided nature trails in the Valley of Flowers.
7. Some booklet and pictorial books should be prepared by forest development people pictures showing flowering plant and wild animals found in the Valley of Flowers. Some sky should be placed on the edge of trail regarding the conservation and distance to the Valley of Flowers.
8. Tourist at Ghangaria should be shown some video film for the conservation of Valley of Flowers.
9. According to the villagers grazing should be allowed to reduce polygonium weed and to disseminate the seeds of flowers from one place to another place in the Valley of Flowers.
10. Poaching of animals by smuggler militants and bridge guards should be stopped at Ghangaria, the gaps in Valley of Flowers should be patrolled during the off season. This job should be given to the local people of

Bhyunder villages for their socio-economic upliftment and inclination towards the conservation of Valley of Flowers.

11. Dustbin in the shops in the way from Govind Ghat should be encouraged with the help of villagers.