

It can hardly feel comfortable with an arrangement where Karnataka retains and controls all dams and diverts portions of Mahadai waters in return for some wattage of power. Every variation in Mahadai level will be crucial for Goa's ecology, transportation, agriculture and marine produce.

Whatever the arrangement to garner the huge monsoon runoffs in the Ghats streams and their catchment areas, it should not affect or disturb the forests, the ecology and environment, and suffer the mortification of submitting to political expediency, commercial lobbying, financial grab and quickfix solutions. Regeneration of degraded/denuded/destroyed forests and extending forest cover to wider areas are a viability and a rational answer - economy-wise, employment-wise and environment-wise. In this effort what needs to be definitely excluded is the monocultured plantations and commercial greenery of Australian acacia and Mangium and other such misfit varieties, under which nothing grows and over which nothing sits.

This request in sequel, and in all earnestness is to help save the Mahadai valley from destruction, submergence and denudation and preserve its gift of ecology and environmental balance.

Rainforests, a fragmented story - The Kudremukh Experience

by Karthikeyan Vasudevan and A.J.T. Johnsingh

The Kudremukh National Park probably has one of the last remaining contiguous rainforests of the Western Ghats in its folds. It was a whole new experience after having worked in the rainforests of the southern Western Ghats to find a similar forest with varied structure and different tree species. The forests at 1000 to 1200 m elevation resembled the high elevation (> 1400 m) wet evergreen forests or "shola forests" of the Anamalais. The mountain had open grasslands interrupted by dense evergreen forests. According to Mr. Niren Jain, trustee of Kudremukh Wildlife Foundation and an enthusiastic naturalist working in the area, these forests are contiguous with the low elevation evergreen forests of Agumbe. The total area under the rainforest now is estimated to be close to 400 sq. km. Out of sheer instinct, we scanned the ridges for an impending sighting of Nilgiri tahr. These endemic mountain goats have not been known to occur north of Nilgiri Hills in the Western Ghats. Similarly, the endemic primate Nilgiri langur is absent, while the lion-tailed macaque is reported from the Kudremukh-Agumbe forests.

The trees in Kudremukh have peculiar buttresses that are akin to stilt roots of mangrove vegetation. This is probably an indication of inundation of these forests as a result of intense rainfall during the southwest monsoon. Kudremukh receives about 2000 mm of rainfall in the months of June and July every year. Among the maze of climbers that raced up to the canopy, the drooping inflorescence with bright funnel-shaped, nectar-laden flowers of *Thunbergia mysorensis* was striking. The enormous biological diversity of the forest was borne out by the fact that we found five amphibians belonging to five genera within a few meters of search of the forest

floor. As we emerged out of Kudremukh National Park after a day-long outing, we were rewarded with the sighting of a magnificent gaur bull in a grassy opening.



A glimpse of the rainforest of Kudremukh

- Dr. A.J.T. Johnsingh

The distinction of the forest maintaining its contiguity with similar forests in Agumbe in the north is threatened by a large number of habitations on the boundary of the forest on the western slope. Furthermore, on the eastern side the forest has been cleared for coffee plantations. There is an iron-ore mining site run by the Kudremukh Iron Ore Company Ltd. (KIOCL) which has been extracting iron ore from an area of about 900 ha within the National Park. The company earns foreign exchange approximately worth Rs.500 crores each year. The renewal of its mining lease period and the seepage of concentrated ore from the underground channels and the resulting pollution of streams and rivers in the national park have been questioned by several conservation organisations. It was learnt that the KIOCL has already depleted the iron deposits in the existing area and is pitching for new areas within the PA to be carved out for mining.

The large areas that have been either abandoned or will be done so in the near future pose a daunting task for park managers, conservationists and biologists. Restoration of these opened up areas for wildlife is of vital importance. In the earlier attempts at afforestation, *Acacia auriculiformes* or *Eucalyptus* species have been used. The restoration of the mined areas instead, should be done with native species of trees or grasses.

Valley of Flowers - A Threatened Abode

by C.P. Kala

The world famous Valley of Flowers in Garhwal Himalayas that attracts tourists from all walks of life is in danger. At the time of its declaration as a National Park in 1982 people were averse to the idea as it put a complete ban on livestock grazing within the park. A decade later the controversy fuelled again, by the burning issue

of *Polygonum* (*Polygonum polystachium*) as it was believed that this herb was spreading in the park and subsequently suppressing the valley's native flora. The spread of *Polygonum* in the park was then directly correlated with the ban on livestock grazing and pressure was mounted for reopening the park to livestock grazing. To study this conservation-oriented problem the Wildlife Institute of India, in 1993, launched a research project in the Valley of Flowers. The outcome of this study was published in a report entitled 'Ecology and Conservation of the Valley of Flowers National Park, Garhwal Himalaya'. The report points out that *Polygonum* is one of the native plants of the Valley of Flowers.

Alpine plants usually grow in patches and *Polygonum* mostly grows in camping sites, loose soil and tree line areas. During my three years stay in the Valley of Flowers I observed that most tourists did not travel to the valley's central part and lower slopes due to the long, arduous 15km trek from Govindghat over steep mountains. Thus, on many a occasion tourists returned with false impressions. Many tourists visit only the tree line and some lower areas in the valley that form the habitats of *Polygonum*. Some of the tourists manage to climb little above the tree line and others take help from porters to watch the valley. These porters have nothing to do with the sentiments of the tourists and they just show the valley to the tourists from the very lower areas (sub-alpine forests). They also convince the tourists saying that no more flowering occurs in the valley and the valley is just like this place only and bring them down. These factors, though minor, are enough to mislead the tourist parties.

There are other factors which one should bear in mind before visiting this valley. The valley possesses a tremendous beauty and is a treasure trove of flowers. Nearly 500 flowering plants have been reported so far from its 87.5 sq. km area. However, it is not possible to see all these flowers during a visit of a few days. These flowers are seasonal. A visitor needs to know the rhythmic flowering patterns of the plants in the valley. For example, if one wants to see the varieties of *Primulas*, one should visit the valley towards the end of May or in June because by July this beautiful flower completes its life cycle. To smell a nice fragrance of *Brahmakamal* (*Saussurea obvallata*) one should visit the valley in August and at least climb upto 3850 meters, as it does not grow below this altitude. Most of the tourists are unaware of this rhythm in flowering of plants, consequently going back with false impressions.

As stated earlier, ban on livestock grazing inside the park is not a threat to the valley as there are wild ungulates, which help maintain the valley's ecosystem. Secondly, since the collection of medicinal plants has been stopped from the valley their population seems to be increasing inside the valley whereas outside it, some of the rare medicinal plants are totally absent. *Katuki* (*Picrorhiza kurrooa*), *Barmola* (*Megacarpaea polyandra*), and *Atis* (*Aconitum violaceum*) are a few examples of such herbs. At present one of the major threats to the valley is the expansion of

Ghangaria, a summer settlement of locals and tourists located 1 km before the park boundary. Its expansion is resulting in the heavy deforestation of sub-alpine forests and landslides in this fragile



Flowers of *Caesalpinia decapetala*

-Dr. G.S. Rawat

ecosystem. The forest check post at Ghangria notwithstanding, felling of trees and smuggling of rare medicinal plants is going on from vicinity of the park areas. Due to the total absence of any waste management programme, hundreds of tons of waste lies in the backyard of hotels, restaurants and *Dhabas* constructed all along the way to Valley of Flowers and Hemkund Saheb. One can see heaps of garbage just 100 m before the holy Hemkund Saheb. Luckily the problem of garbage is less inside the national park due to protection and many of the visitors take back the waste

materials while returning to Ghangaria. Solid waste is a problem that needs to be urgently tackled



Brahmakamal, Valley of Flowers

-Dr. G.S. Rawat

At Govindghat, situated about 18 km from Joshimath, on January 5, 1999, the former Chief Minister of Punjab, Rajender Kaur Bhattal laid the foundation for a 30km motorable road to Hemkund Saheb via Ghangaria. For the construction of the road the International Khalsa Foundation and various other like-minded organisations have pooled together Rs.50 crores. There is also a plan to build parking facilities at Govindghat for 500 vehicles and 500 rooms staying facility at Ghangaria. This heavy construction activity is being planned without looking into its environmental consequences in this ecologically fragile ecosystem. The construction will not only adversely

affect the ecological balance but also pose a serious risk to the well being of the Valley of Flowers. Vehicular pollution and heavy tourist influx as a result of a motorable road will pose a serious threat to the native flora and fauna of this region. Today there is an urgent need to protect the fragile ecosystems represented by areas like the Valley of Flowers. An ecological crisis in the mountains will be a preliminary indication of collapsing society and economy of the country. It would only be wise of us to not neglect these mountains, especially an abode like Valley of Flowers.