

Grassland ecosystem and grazing policy

In the food web, herbivores are established to play an important role in maintaining the ecological health of an ecosystem by consuming a sizeable quantity of available vegetation. With the evolution of biodiversity conservation theory, grazing and browsing of herbivores has been generally treated as an unsustainable practice for long-term conservation of wild flora. As a result, livestock grazing has been stopped in the protected areas, especially in the National Parks. However, after the ban on livestock grazing, there seems to be chaos on the continuation of this policy mainly due to (i) violation of rights of local pastoral communities, and (ii) diverse sets of opinion on its impact on natural vegetation.

There is resentment among various forest dwellers (semi-arid, arid, tropical, sub-tropical, temperate, alpine, sub-alpine) over continuing the ongoing conservation policy of banning the livestock in protected areas. One of the reasons for the resentment is the wastage of forage, as it is not being used wisely. In the tropical grasslands, grasses are burnt as this is one of the traditional practices of maintaining grasslands. This is done in spite of the fact that the grasslands can be used for livestock grazing.

The removal of livestock from grasslands also indicates establishing forests over a period due to secondary succession if not burnt, harvested, and eradicated by some mechanical ways. The

conservation policy seems to be following the preservationistic approach, if the utilitarian process is overlooked. The fear of grasslands becoming endangered due to invasion by trees if not maintained mechanically, is widespread all across the globe.

It is also established that response to grazing is more diverse and depends on its evolutionary and climatic context in different regions¹. The alpine meadows lying above timberline being a different entity obtain different response to livestock grazing due to severe cool climate and major precipitation in the form of snow. However, there have been diverse opinions on the ban of livestock grazing in the alpine meadows of a world heritage site, the Nanda Devi Biosphere Reserve in the Indian subcontinent. The Valley of Flowers is one of its two National Parks that lies above timberline and is also famous for its more than 500 colourful flowering plant species².

After the declaration of the Valley of Flowers as a National Park in 1982, it has been argued that removal of livestock grazing has resulted in the proliferation of a tall knot weed, *Polygonum polystachyum* that is causing the decline of native flowering plants. Research conducted over a decade in this valley on this conservation-oriented problem has demonstrated that *P. polystachyum* is not a threat to the valley's native vegetation and its ecosystem, as it grows in unstable

land areas such as freshly eroded, avalanche-prone, past camping and bouldery areas. There are reports on similar trends and habitat preferences of genus *Polygonum* elsewhere³. Moreover, the lack of knowledge on the seasonality of alpine plants is also fuelling the controversy⁴.

Considering the importance of grasslands, livestock grazing practices and joint natural resources management along with eco-development concepts, there is an urgent need to develop a strong and viable grazing policy for livestock grazing, and ecosystem and environment management. Moreover, in view of the diverse climatic and geographic set-up, it is necessary to develop a separate grazing policy for the mountainous ecosystem, especially the Himalaya.

1. Perevolotsky, A. and Seligman, N. G., *Bio-Science*, 1998, **48**, 1007–1017.
2. Kala, C. P., *Curr. Sci.*, 2005, **89**, 919–920.
3. Sultan, S. E., Wilczek, A. M., Hann, S. D. and Brosi, B. J., *J. Ecol.*, 1998, **86**, 363–383.
4. Kala, C. P., *Biodivers. Conserv.*, 2004, **13**, 985–995.

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Classifying species at risk: Conservation problem

Increasing worldwide concern over the present state of biodiversity has now given a new lease of life for exploratory studies. Neglected in the past, our knowledge about the floristic and faunistic diversity of the world as well as our country is far from complete¹. The impacts of human activities have led to severe changes in natural ecosystems that have resulted in extinction of many plant and animal species, and are threatening many more. International Union for Conservation of Nature and Natural Resources

(IUCN) compiles databases about species at risk on a worldwide scale. The classification method most widely used was developed by IUCN, utilizing the population size or trends in other factors associated with the vulnerability to extinction.

IUCN classifies species in the following categories: extinct, extinct in wild, threatened, lower risk and data deficient (indeterminate). Indeterminate species are taxa known to belong to any of the threatened categories, but lacking enough information to assign them in an appro-

priate category (critically endangered/endangered/vulnerable). According to the 1997 IUCN Red List of Threatened Plants, globally 33,418 species are included under threatened category. Of this, 4070 species are under the status of indeterminate. India is one of the megadiversity nations in the world. It has about 17,000 species of flowering plants and about 5400 endemic species. Of the 1236 threatened species in India, 690 species are placed under indeterminate status². That is, 12.2% of species at global level and 55.8%