Annals of Arid Zone 52(3&4): 223-230, 2013

Western Himalayan Cold Deserts: Biodiversity, Eco-Restoration, Ecological Concerns and Securities

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Abstract: This paper provides an insight into the intimate relationships between plant diversity, land degradation and ecological concerns in the cold deserts, which is a unique eco-system of Western Himalayas. Undoubtedly, addressing desertification, including land, soil, water and plant degradation, can certainly facilitate or ease the ecological concerns, but may not completely solve it in presence of the other issues, related causes and the effects. In view of the fact that very little or for that matter no site specific research work has been done in these fragile but ecologically significant areas, an attempt has been made to offer some suggestions, in the wider context, so as to evolve and develop ecologically and socio-economically sensitive and acceptable strategies for holistic development of the area under reference.

Key words: Cold deserts, ecosystem, biodiversity, hot spot, land-use, degradation.

Biodiversity usually refers to the variety within a living organism and the broad usage of this term embraces many different parameters. In the heart of ecological research and the related conservational aspects, biodiversity gains significance since all types of organisms that exist in nature are important, both from scientific and social point of view. What is required now is to collect, collate, relate and document the existing natural wealth for the ultimate benefit of living organism in particular and to the society at large.

India, one amongst the top 12 major mega diversity countries of the world, possess a rich flora of about 17,000 flowering species with a high degree of endemism. The Great Himalayas, covering approximately 10% of India's total land surface, are one of the largest and youngest mountain chains in the world and provide an important habitat to the flora and fauna including 9000 species of angiosperms and hence, considered as the hot spot of biodiversity. In this spectrum, there are about 3470 species considered exclusively endemic to the Himalayas. Fragmentation of ecological factors with the passage of time has, however, led to the habitat loss, mainly due to ever increasing biotic pressure in the cold deserts, which, of course, are of great concern from conservationists' point of view. Compared to other parts of the world, such dry lands are considered to suffer disproportionately from land degradation and desertification (UNCCD, 1994) and have lagged behind in terms of the benefits that have been made from technological advances elsewhere in the world linked to food production and the related aspects.

It may specifically be mentioned here that the diverse climate and varied environmental conditions prevailing in the region require equally different strategies for eco-rehabilitation of such areas. The issue gains further significance in view of the fact that bio-capacity constraints, other biological thresholds, bio-physical assets including other ecosystem regulating functions (Stringer *et al.*, 2011) also hold good for the cold deserts of Mighty Himalayas and, therefore, requires constant, consistent and site specific research inputs and development of the strategies for the holistic and sustainable development of these harsh and fragile areas.

This article, therefore, seeks to provide a review of the relationships for all such aspects for sustainable use of the resources in the cold desert areas. It looks at the role of different environmental and bio-physical factors and then highlights the economic and social factors that contribute to the extent and expense of desertification. It further identifies the issues for sustainable management that can provide a useful tool for addressing these issues at the local level.

Cold Deserts in India

Cold deserts refer to an area where the climate has characteristics and great extremes of hot and cold combined with excessive dryness.

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