

Bio-Diversity Conservation and Forest Fires in Himachal Pradesh: Issues and Challenges

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Bio-Diversity

Bio-diversity refers to the variety of life forms, such as the plants, animals and micro organisms, the genes they contain and the eco-system they form. Usually bio-diversity is classified into three groups: (i) genetic diversity, which refers to the variation of genes within species. It explains genetic variation between distinct populations of the same species and also genetic variation within a population, (ii) species diversity, which refers to the variety of species. It can be measured on the basis of species richness, species abundance and phylogenetic diversity and (iii) ecosystem diversity, which encompass the broad difference between ecosystem type and the diversity of habitat and ecological process of occurring within each ecosystem.

Benefits

In general, benefits arising from the conservation of components of bio-diversity can be classified into three groups viz., ecosystem services, biological resources and social benefits.

(a) Ecosystem Services

Bio-diversity performs a number of ecosystem services. It includes the soil formation through decomposition of dry leaves and other plant parts and it helps to conserve soil moisture. Bio-diversity of plant species accelerates and maintains the rain fall level and in-turn protects the water resources in the country. The climatic regulation and stability depends on the bio-diversity of plant species. Through maintaining the bio-diversity, one can prevent unpredictable events like deforestation, decertification and global warming. Bio-diversity estimation helps to preserve and conserve the endangered species. It helps to minimise the effects of atmospheric pollution by discharging required level of oxygen. The multiplication of number of species of plants and animals explains the status of breeding stock and population reservoirs and their expected increase in numbers in the near future. Through assessment of existing status of bio-diversity, the future potential can be predicted.

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(b) Biological Resource

The continuous availability of biological resources for future generation depends on preservation and conservation of biological resources. Hence there is a need of an optimum utilization of biological resources. The important biological resources that one obtains through biodiversity are (i) food, (ii) medicinal herbs and shrubs (ñi) wood products (iv) nutrient storage and cycling (v) waste (vi) animal based products and so on.

(c) Social Benefits

Species conservation is not only justified in economic terms. Aesthetic, ethical, cultural and scientific considerations provide ample grounds for conservation. It helps to conduct research on life and habitat of many species of plants and animals and also enable people to live with nature. Further, bio-diversity helps to promote cultural values, recreational values, apart from the maintaining ecosystem.

The Value of Bio-Diversity

Bio-diversity provides a foundation for the continued existence of a healthy planet and our own well being. Bio-diversity generates greater resilience. It is to be noted that when ecosystems are diverse, there is a pathway for primary production and ecological processes, such as nutrient cycling so that if one is damaged or destroyed, an alternative path way may be used and the ecosystem can continue its functioning in the normal form.

If biological diversity is greatly reduced, the functioning of ecosystem is put at risk. The multiplication of genes, species and ecosystems is a resource that can be tapped as human needs change. Bio-diversity conservation entails a shift from a reactive posture protecting nature from the impacts of development to a proactive effort seeking to meet people's needs from biological resources while ensuring the long term ecological sustainability of earth's biotic wealth. At global level it involves not only the protection of wild species and their habitat, but also the safeguarding of genetic diversity of cultivated and domesticated species and their wild relatives. The conservation of biological diversity seeks to maintain life support system provided by the nature in all its ways and the living resources are essential for ecological sustainable development.

Unsustainable Features of Bio-Diversity

Bio-diversity is threatened by many factors. Hence, there is a need to analyse few of them for the purpose of the present discussion.

Deforestation is a major cause behind destruction of biodiversity. It takes place in the following ways:

1. The mono-cultivation practice is one of the causes for deforestation in India. The replacement of natural forest ecosystem by mono specific tree plantation leads to the disappearance of a number of plant species; this situation leads to deforestation in India.
2. Forest fires are also one of the causes for deforestation. Forest fires are intentional caused by human beings; accidental fires also caused by tribes. They destroy forest vegetation i.e. bio-diversity.
3. Undertaking of development activities in the forest area is another cause for deforestation. It means conversion of forest for development activities.
4. The expansion of tourism in forest areas poses serious environmental degradation leading to endangering flora, fauna species and other environmental resources.
5. The rate of reduction in conservation of forest is one of the causes behind deforestation.
6. Increase in livestock population is an important cause for deforestation in India. Grazing by domestic animals in the forest has caused the adverse effects of death of natural and planted seedlings, soil erosion etc.
7. Illicit exploitation of forest wood is another cause for deforestation. It may be noted that the increasing use of wood in construction and commercial uses has led to dramatic increase in smuggling. This situation has led to deforestation.
8. Both rural and tribal populations are dependent on the forests surrounding their villages for meeting their daily needs of fuel wood and it is a major reason for deforestation.

Besides deforestation some other causes are responsible for unsustainable features of bio-diversity. These are:

9. Bio-diversity is disturbed on the consequences of harmful fishery practices and over exploitation of fisheries. It may be noted that 16 albatross species have been threatened by long line fishing (as per the 2000 IUCN Red list)
10. Land degradation in consequence of applying chemical fertilizers affects the bio-diversity of earthworms.

11. Low biomass generation in consequence of destruction of biodiversity.
12. The practising of shifting cultivation replaces some of the traditional variety of crops cultivation. This situation leads to a disappearance of some crop varieties.
13. The destruction of mangrove vegetation affects the bio-diversity of marine life and Halophytic vegetation.
14. The indiscriminate exploitation of coral reefs leads to destruction of its bio-diversity. It may be noted that coral reefs with an estimated half million species in their 400000 square kilometres are being depleted at rates that may leave little but degraded remnants by this century.
15. The practising of mono-cultivation is one of the causes that threatens the bio-diversity. The replacement of forest ecosystem by mono specific tree plantation can lead to disappearance of a number of plant and animal species.
16. The practising of shrimp culture around the coastal ecosystem destroys the bio-diversity of marine living organisms due to the discharge of toxic chemicals from the shrimp ponds into the marine water.
17. The use of chemicals to control insects, pests, weeds and fungi enhances the productivity of crops. But their excessive use destroys some of the beneficial insects and also affects the health of human beings in the form of pesticide poisoning.
18. The introduction of alien species i.e., the introduction of grey squirrel in the United Kingdom has decimated the indigenous and squirrel population. The introductions of the Nile Perch into Africa's Lake Victoria during the 70s are reportedly threatening the survival of more than 400 species of small fish.

Forest Fire Management

Fire situation in India is alarming. There is no focus on fire in India. There is no clear fire strategy or an awareness of strategies planning. Statistical data on forest fires where available are either skeletal or unreliable. No system exists for fire weather forecasting, danger rating, and fire reporting or preventive measures apart from some basic, fire line clearance and prescribed burning on plantation boundaries. India's forest deserves a full fledged fire management. Without a deep understanding of this field one cannot find solution to forest fires. More and more research should be done on this issue by local institutions. The time has gone when common people used to see for development functions from top government authorities and they were out of

reach. Now the scenario has totally changed and powers are vested with local institutions. Panchayati Raj Institution and voluntary organizations like NGOs, NSS, and NCC need to contribute and involve themselves in tackling these problems. Community participation is a must for the success of any developmental programme. Panchayati Raj Institutions are backbone of our democratic set up. 73rd Constitutional Amendment Act, 1993 gives constitutional status to the Panchayati Raj Institutions or local self government, but despite this constitutional status there are some demotivating forces like: (i) lack of interest, (ii) lack of self reliance, (iii) lack of self reliance and (iv) lack of social status of the member.

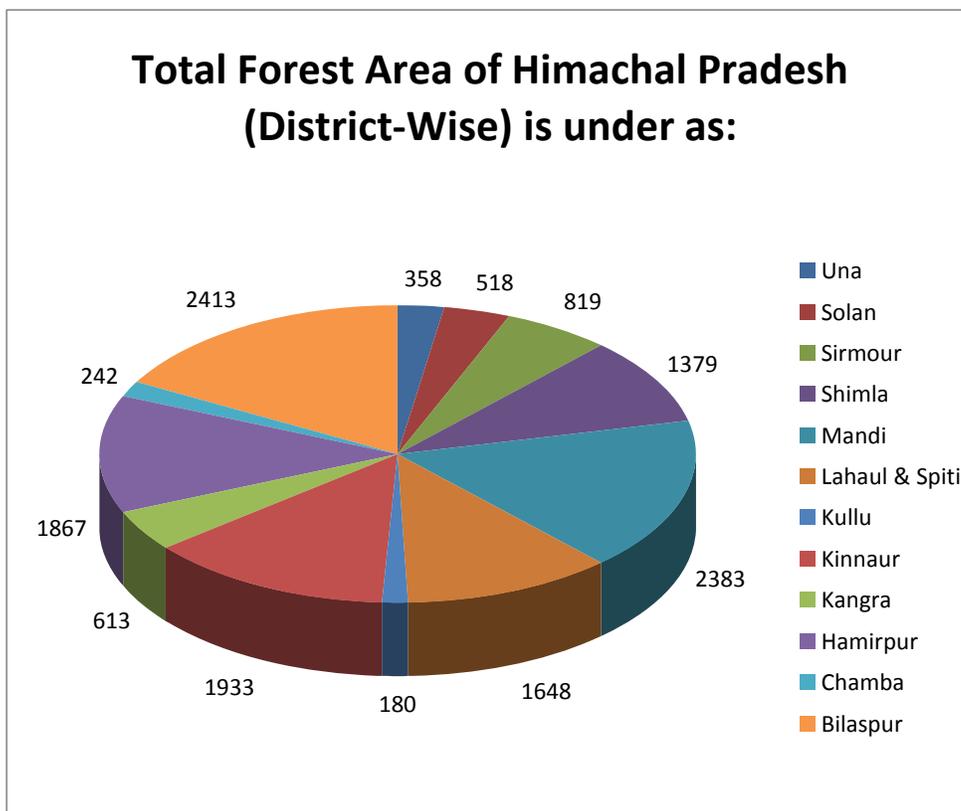
Motivation and awareness can come only through adequate awareness. Along with Panchayati Raj institutions there is a need of involving local community in different programmes. Empowering people through information technology, the potential in possession and its utilization is the need of the hour.

Forest Fire Management in Himachal Pradesh

India is a vast country with geographical area of 3,287,2632, km. Himachal Pradesh is situated in the north of India. It has 22.20 percent of its geographical area under forest cover (FSI 2001) and the forests have been classified into 16 forest types. India's forests are endowed with a variety of biomass and biological communities. Himachal Pradesh is also rich in its forest land and natural resources. It lies in the lap of Himalayas and extends from the perpetual snowy mountains separating it from Tibet town to Punjab plains. It lies between 30^o 22' 44" and 33^o 1' 40" north latitudes and 75^o 45' 55" and 79^o 04' 20" east longitudes. For hill states like Himachal Pradesh the forests have to protect hillside against erosion, moderate the water flow and ameliorate physical and chemical factors of the locality. The National Forest Policy lays down that forest should cover two thirds of the geographical area. As per the legal definition of a 'forest' forest cover should be 37, 591² km or 67.52 percent of the total geographical area of Himachal Pradesh. It consists of hilly terrain crossed by big and small rivers, rivulets, *nalas*, glaciers and deep gorges. Being a state saddled with the responsibility of selling a large number of irrigation and hydroelectric dams, it needs a bigger forest cover for their conservation. But these forests are degrading day by day due to many reasons and forest fire is one of the main causes behind this degradation. From 1st April 2004 to 15th May 2004 there were 939 cases of forest fires occurrences in the forests of Himachal Pradesh and there was a loss of about 107 lacs.

At least 10,000 to 12,000 hec. area of forest is burned every year largely intentional fires.

Against the national average of 2.73 percent of the area under forests, Himachal Pradesh can boast of 38.00 percent. But these forests are degrading day by day, details of forest fires in Himachal Pradesh during the previous years are pictorially shown below.



Recorded Forest

Total Geographical area	55673
Total Forest area	37,033
Unreserved	2094
Reserved Forest	1896
Protected Forest	33,043

Source: Report of FSI 2003

Details of Fire Incidences from 2000-01 onwards

Year	No. of incidents	Area Affected (in	Estimated loss
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		ha.)	(Amount in Lakhs)
2000-01	301	5719	4672000
2001-02	282	4204	4226640
2002-03	550	9896	7430912
2003-04	769	12865	8641514
2004-05	391	6002.2	3639254
2005-06	494	8195.7	4701082
2006-07 (up to 21-06-06)	126	1395.6	1087537

Source: *H.P. Forest Department*

Forest provides life support not only to the people of Himachal Pradesh but also to those in the plains.

Suggestions and Policy Implications

There is an urgent need to formulate a policy at state level as well as national level towards forest fire protection and bio-diversity conservation. The above discussion highlights the unsustainable nature of bio-diversity. However, bio-diversity is essential for the continued existence of a healthy planet and our own well being. Maintaining the strength of bio-diversity or increasing bio-diversity potential depends on the following measures:

1. The preservation and conservation of bio-diversity depends on eco-planning. Its formulation and implementation depends on the creation of people's bio-diversity register.
2. Introducing a proper crop planning should discourage the practicing of mono-cultivation and shifting cultivation.
3. There is a need to allocate more finance for preserving and conserving the forest vegetation in different parts of the country.
4. There is a need to implement reforestation programme in order to have minimum forest cover for affording long range of ecological stabilization.
5. The eco-plan should encourage bio-diversity and wherever possible, endangered species should be rehabilitated in their own habitat by taking into account their population structure and breeding characteristics.
6. There is a need to re-vegetate the wastelands, biosphere reserves and fragile ecosystems with indigenous species.

7. People should be motivated to take part in social forestry programme. In this connection their cooperation and involvement are essential with respect to modern nursery creation of elite trees of the local species relevant to the particular end use and land use.
8. The discharge of pollutants into the water bodies should be checked with a view to safeguard the bio-diversity of planktons and nektons.
9. The destruction of coral reefs should be checked with a view to safeguard the bio-diversity of planktons and nektons.
10. The destruction of coral reefs should be prevented and it helps the coastal people to protect themselves against the harmful effects of cyclone and other natural calamity.
11. There is a need to protect the mangrove vegetation by establishing clubs in the coastal villages with the participation of local people.
12. The discharge of toxic chemicals from the shrimp farms into the coastal water should be prevented and it will aid in preventing the destruction of some of the marine living organisms.
13. There is a need to encourage organic farming as it contributes more farm bio-diversity than the modern farming.
14. In order to sustain the life of soil, faunal population like earthworms, termites and ants, the bio-fertilizers and other organic inputs should be applied to raise the crops.
15. There is a need to propagate awareness about bio-diversity among our people in the form of creation of eco-clubs in our rural areas. Through eco-clubs the awareness on importance of preservation and conservation of various species of plants and animals' species should be generated for the benefit of rural population by conducting non-formal education, awareness generation programme, awareness campaign, training programme, awareness training programmes and cultural programmes. This task should be left in the hands of NGOs.
16. In order to spread vegetation in the drought prone areas and desert areas, there is a need to introduce drought resistance crops and other suitable species of plants in these areas. This would help in disseminating bio-diversity in the areas which are prone to desertification.

17. One needs an integrated approach among different agencies of forest fire protection in Himachal Pradesh at Panchayati Raj level.
18. There is a need to create more awareness about forest fire problems in rural areas.
19. There is an urgent need to provide awareness programme, workshops, seminars, theoretical and practical knowledge about forest fires protection to community.
20. Creation of job opportunities, especially in rural sector, for better initiative of forest fire management.
21. Special attention and efforts are required to plan, implement, evaluate and control the forest fires with the assistance of local leadership at grassroots.
22. NGOs have to play a vital role in the field of research, surveys, documentation, awareness programmes, resource mobilization and capacity building in local institutions.
23. Developing environment friendly behaviour and positive attitude and values among local leadership and community is the need of hour to make the whole community conscious about the ecosystem and ecological balance.
24. There is an urgent need for developing effective communication networking between all the active agencies relating to fire protection in the local level institutions.
25. Last but not least there is a need of 'volunteer village fire brigade' to prevent and suppress forest fires in the rural areas.

References

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