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Full Length Research Article

Challenges and Policy Implications of Forest Resources in the Indian Himalayan Region

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Amongst the global mountain systems, Himalayan ranges stand out as the youngest and one of the most fragile regions of the world; Himalaya separates northern part of the Asian continent from south Asia. The Indian Himalayan Region is covered with diverse ecosystems i.e. from snow filled peaks to lush green forests to cold deserts of Ladakh. The people of the IHR, like elsewhere in other mountain ecosystems, are heavily dependent for their livelihood on their surrounding natural resources and production from primary sectors such as agriculture, forestry and animal husbandry, etc. In the current times, there are different policies implemented to manage and maintain the forest resources of the Indian Himalayan Region. Alongside, there is a continuous struggle with the challenges like drought, landslides, species invasions, insect and disease outbreaks and climatic events such as global warming, windstorms, glacier outburst floods, etc. The policies of the earlier two eras were largely regulatory in nature. A participatory and sectorally coordinated mixed governance approach is needed to sustain forest resources in the IHR. To combat such challenges there is a need for some proper enforcement of running policies and practices, and to make some new reforms.

Introduction of Forest Resources

Magical and magnificent mountains play a key role in forming the cornerstone of a healthy ecosystem of India. Among the tallest and resplendent mountain ranges in the world, many mountain ranges with most attractive sceneries, ecosystems, diversified altitudes as well as wide range of flora and fauna are found in India. Hilly regions have their own prominent significance in terms of natural resources, ecology, economy and socio cultural perspectives/diversity. Undoubtedly hilly regions are endowed with diverse natural resources and inhabitants of these regions are highly dependent on them.

Due to the scenic beauty and pristine environment, hill stations are being hotspots for tourism industry; high pressure of tourism on these tourism spots elevates natural resource and environmental degradation. This enhances need for their conservation and sustainable use. Among the natural resources of hilly regions, especially forest resources are under acute stress due to various natural calamities and anthropogenic activities. Forests are one of most important natural resources of the Earth, having both economic as well as ecological significance. Their economic importance is evident in form of productive function they play in lives of inhabitants of hilly regions. Forests are major element of Indian landscape covering about 21.54% of the geographic area of the country as per current assessment. The

total forest cover of the country, is 7,08,273 Km² which is 21.54% of the geographic area of the country. In terms of density classes, area covered by the Very dense forests is 2.99%, moderately dense forests is 9.38% and open forest is 9.18% of total geographical area of the country. Indian Himalaya Region (IHR) includes the Himalaya and adjacent mountain ranges in the North-east region within Indian territory, spreading on 10 states (administrative regions) namely, Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Mizoram, Tripura, and hill regions of 2 states viz. Assam and West Bengal of Indian Republic, also harbors rich forest wealth. Among these hill states, percentage forest cover was recorded maximum for Mizoram (86.12%) followed by Arunachal Pradesh (79.96%).

Forests of IHR, not only provides numerous ecosystem services to inhabitants of the region but also to those dwelling in lowlands. The forest vegetation of IHR, ranging from tropical dry deciduous forests in the foothills to alpine meadows above timberline also have high biomass productivity (17.0 -21.0 t/ha/yr) quite comparable to the highly productive forests of the world. In the IHR forest is major land use/land cover category (as recorded forest area). The inhabitants of IHR, like elsewhere in other mountain ecosystems have sheer dependence on forest resources for their daily needs like medicine, food (wild edible),

fodder, fuel, timber, making agriculture tools, religious and various other purposes. Today forests are on the brink of depletion owing to high pressure of population and consequently

increasing dependence as well as anthropogenic activities on forestland (Sati, 2006).

Table-1: Forest cover of Hill States in the Indian Himalayan Region

S. No.	Hill States	Forest cover (Km ²)	Percentage (%)
1.	Jammu & Kashmir	23,241	10.46
2.	Himachal Pradesh	15,100	27.12
3.	Uttarakhand	24,295	45.43
4.	Sikkim	3,344	47.13
5.	Arunachal Pradesh	66,964	79.96
6.	Meghalaya	17,146	76.45
7.	Nagaland	12,489	75.33
8.	Manipur	17,346	77.69
9.	Mizoram	18,186	86.12
10.	Tripura	7,726	73.68

(Source: State Forest Report, SFR, 2017, FSI)

Issues and Concerns

Forests are exposed to array of turbulences which influence the composition, structure and functions of forests. The various turbulences include fire, drought, landslides, species invasions, insect and disease outbreaks and climatic events such as global warming, windstorms, glacier outburst floods, etc. Population explosion, changes in life style and expectations, and huge dependence on mountain resources brought conservation and restoration in mountain environments into consideration during United Nation Conference on Environment and Developments (UNCED) in Rio Conference 1992.

The IHR has remarkable landforms and magnificent natural resources, but this fragile mountain ecosystem is prone to various multifaceted threats, converting it into a volatile and vulnerable environment. In present scenario, owing to large dependence of inhabitants of IHR for a variety of biomass needs, forest resources are being exploited at much faster rate than the rate at which these resources are getting replenished. This has brought Himalayan forests under different levels of chronic disturbance. The various issues and problems identified regarding forest resources are as follows:

- **Deforestation:** In Himalaya, degradation of forest cover is a major problem which may lead to cascade of several problems like soil erosion, landslide, fuel wood and fodder crisis, reduced ground water recharge, loss of biodiversity are accelerated with deforestation of slopes.
- **Forest Fires:** Forest fires were reported to affect about 1 percent of all forests each year (Global Forest Resources Assessment, 2010). It has also become an integral part of hilly regions, mainly around the human settlements. In IHR, forest fires of medium to severe enormity are often seen not only in expected months of late spring and summer but also during the long dry spells in winter. In addition to this, anthropogenic pressures increase the loss of forest wealth due to fire.
- **Biotic Factors:** Biotic Factors (Overgrazing, overexploitation, illegal extraction, lopping and encroachment), Illegal extraction of forest resources and their overexploitation led to degradation of rich forest wealth

in IHR. Forest encroachment is also one of the serious issues arisen in hilly regions.

- **Urbanization and Road expansion:** Population outburst and, consequent urbanization with increased demand of food leading to expansion of agricultural land, have led to degradation of forest and it has become a global problem. In the Himalaya too, it has a long history, being well established in late eighteenth century at least. Road construction and expansion issue has become a kind of tug of war between environmentalists, ecologists and tourism entrepreneurs. Undoubtedly roads are lifeline of hilly regions and booster for tourism industry in Hill stations, but their construction as well as expansion costs much more to Hill ecology in terms of biodiversity loss.
- **Invasive species:** Forest biodiversity and resources in IHR are also facing risk of invasive species such as, *Ageratum*, *Eupatorium*, *Lantana*, *Parthenium*, spp. etc. These species are spreading at very faster rates, replacing the forest floor vegetation and reducing the natural regeneration process of native plant communities. Also, they hinder forest operations because of their bushy and spreading type of growth.

Challenges with respect to Forest Resources

- **Climate Change:** Like other ecosystems, forests are also affected by climate change. Implications of Climate change on phenological shifts in plants has been well established globally, particularly in temperate climate that has certain implications on structural and functional aspects of the forests, including mismatch in timing of pollinators, seed maturation and seed germination (Negi, 2018).
- **Forest Degradation:** Increasing populations and reducing resources leading to depletion of forest resources at an alarming rate. The current assessment of forest cover in Northeastern states of India shows an actual decrease of forest cover to extent of 630 Km² in region and reason for this decrease is mainly Jhum cultivation or shifting cultivation and biotic pressures prevalent in the region (FSI, 2017).
- **Man-made Environmental insecurities:** Severe threat to forest resources are Global warming, Population explosion, Forest degradation and loss of biodiversity, Forest Fires, Unplanned Urbanization, Ambitious

Development Projects, Tourism, Illegal extraction of forest resources, Open cast mining without environmental control, expansion of road network, Conflicts, Tensions and Suppression (Khawas, 2009).

- Lack of proper implementation of policy and governance
- Lack of proper benefit sharing of resources among the hill communities

Current Practices and Impact

- The State Forest Departments of IHR states is responsible for management of most of the forest area through scientifically written management plans under various categories: reserved forest, protected forest and protected areas in Western IHR states (99.8% in J&K, 66% in Himachal Pradesh and 69% in Uttarakhand).
- In IHR three broad types of community forestry managements are presently in practice viz., state sponsored Joint Forest Management (JFM) programme being implemented in all the IHR states, Van Panchayat in Uttarakhand, and a traditional system mainly in north-eastern Himalaya.
- According to Late Shri Anil Madhav Dave, former MOS (I/C), M/o Environment, Forest and Climate Change, Government of India, "there are two major afforestation schemes, National Afforestation Programme (NAP) and National Mission for Green India (GIM). Both these schemes are implemented in participatory mode under JFM".
- In many villages, however, some of the village forest is managed by a formal forest committee (Van Panchayats, eco-vikas, Self help Groups and forest management committees).
- In Himachal Pradesh, the local myths and legends associated with sacred groves go a long way in preserving the forests from destruction. There are several groves named Dev Van or Devta Ka Jungle where one is not allowed to cut trees or even carry dry leaves outside the area. 329 sacred groves have been documented in the state.

Current Policy and Its Implications

Mountains need specific attention for their contribution to global goods and services, especially by developing and implementing mountain specific policies. Conservation policies have evolved from the protection of charismatic species, to habitat and ecosystem/landscape conservation, and, finally, to people-oriented conservation approaches. Being a mega diversity country in the world, India with different types of forests has officially 20 per cent of geographical area under forest cover. The National Forest Policy (1988) aims to increase the forest cover to one third.

The start of biodiversity conservation and management in the Himalaya dates back to the nineteenth century, along with the exploration of the region by botanists, zoologists, and nature explorers from around the world. These efforts were mostly conventional approaches to conservation. During the past two decades, systematic people and eco-centric approaches to conservation have emerged in the Himalaya. The conservation

initiatives taken by the Hindu Kush Himalayan countries along with support from ICIMOD and other organizations have identified many conservation priority landscapes and corridors across the Himalaya (WWF and ICIMOD, 2001).

The current Revised H.P. Forest Policy 2006 moves away from productive sustained yield forestry in favour of sustainable forest management, which emphasizes participation and the active involvement of local communities such as the Panchayati Raj.

National Policies: Indian Forest Act (1927) and its successive amendments 1980; India Forest Policy, 1952; Wildlife protection act 1972 and Amendment Act 1991 and 2002; Forest Conservation Act, 1980; Environment Protection Act, 1986; National Forest Policy of 1988; National Conservation Strategy and Policy Statement, India, 1992; The Wildlife Action Plan, 2002–2016; Biological Diversity Act in 2002; National Action Plan on Climate Change, 2008; National Biodiversity Strategy and Action Plan, 2009; National Green Tribunal Act, 2010; and Access and Benefit Sharing guidelines 2014.

National Laws: The chapter on fundamental duties of the Indian Constitution clearly imposes duty on every citizen to protect environment. The articles related to this are as follows-

- **Article 51-A (g)**, says that "It shall be duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures."
- **Article 48 -A** of the constitution says that "the state shall endeavor to protect and improve the environment and to safeguard the forests and wild life of the country".

Management Options

- Sustainable forest management represents a new look at forests and forest management to meet two major commitments:
 - i. Protect and restore the forest ecosystem.
 - ii. Encourage profitable enterprises, attracting the investor who sees sustainability as a viable economic venture.
- Forest management practices involving the communities include Joint Forest management (JFM), Eco-Development Committee (EDC) and Van Panchayats.

Promotion of in-situ and ex-situ conservation: Mass multiplication and development of conventional and in-vitro propagation, Rehabilitation and reintroduction of species in the suitable identified natural habitats, Restoration of the degraded sites and habitats, Promotion of the medicinal plants in cultivation, Establishment and maintenance of gene banks.

- Monitoring populations, habitats and extraction of economically and ecologically important plants.
- Organization of awareness generation programmes.

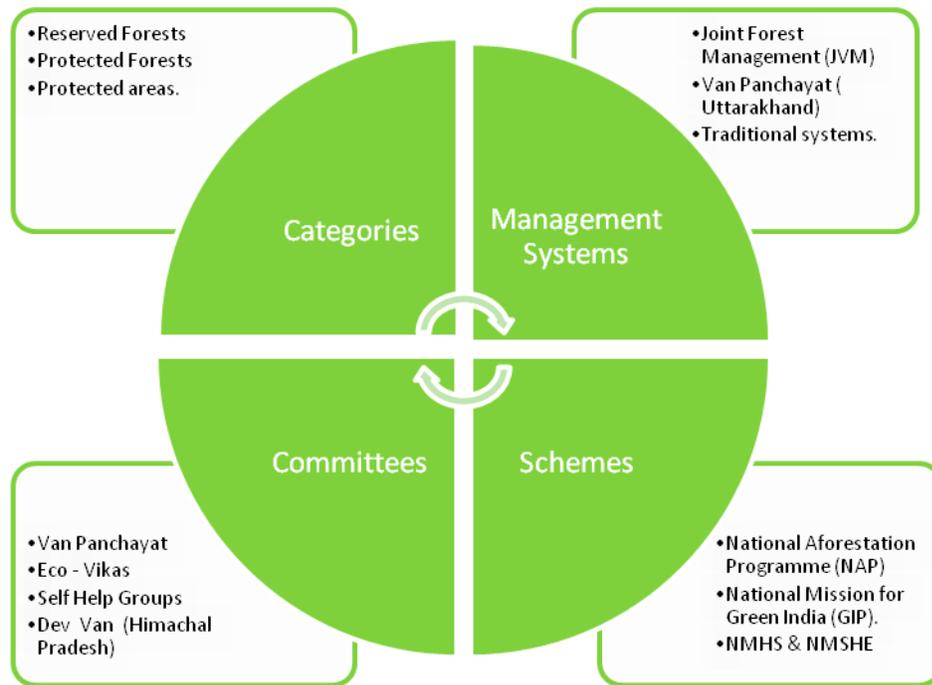


Fig.1: Framework for Forest Management Policies

Probable Solutions

Forest managers are mainly responsible for actions at the local level, but viewing forest degradation in the context of larger scales may be beneficial. The time needed to design programmes to address drivers and reconcile the interests of multiple stakeholders should not be underestimated. Suggestions and future guidelines w.r.t. policy & practices are:

- The forest sector strategies developed for Himalayan states must be sensitive to the uniqueness of mountain environment and must prioritize the interests of its people.
- To avoid issues like forest degradation, massive lopping of trees, habitat loss, depletion of biodiversity, landslides, deforestation and forest encroachment etc., plantation of evergreen or deciduous broadleaved and coniferous plants is urgently required.
- *Ex-situ* and *in-situ* conservation, mass cultivation and multiplication to grow plant seedlings *in-vitro* or *in-vivo* procedures is needed to protect the forest cover.
- Community forestry is need to be promoted where local communities together with their local government and other local organizations such as schools, institutes, colleges, universities, corporate sectors, and NGOs join hands to start localized tree planting programs and management of their local forests on various occasions.
- Awareness regarding Eco-forestry, where cutting down of trees happen in an environmental friendly manner, should be increased. Thus eco-forestry not only calls for the preservation of the forest ecosystem but also allows for controlled and green timber extraction and needs to develop a proper harvesting mechanism for a suitable ABS practice.
- Green methods of production and utilization of resources can immeasurably reduce the loss of forest

products. Therefore promoting and encouraging green business is required.

- Continuous and regular monitoring of forests by proper planning and supervision is essential for the sustainable use of forest resources and for good quality forest regeneration.
- An appropriate policy and management option must be developed to prevent the heavy extraction of forest resources illegally in the hills.
- Clear and complete cutting of trees from a particular geographical location must be banned by employing a series of rules and laws. Therefore, improvement in the implementation practices of several government policies is needed.
- Sensitization and educative campaigns can be a simple but a more effective solution. Loss of forest resources can also be counteracted through awareness and sensitization. Initiating awareness creation campaign makes it easy for people to detect the causes, effects, and ways of counteracting the loss of forest resources.
- Making conscious efforts to share information of the loss of forest wealth with people including family, friends, colleagues, and the entire community is important as it is an appropriate measure of standing up in unison to combat the loss of forests.
- Increasing demand in the urbanization and agricultural practices has kept on cleaning the forests to create more room for the activities. In response to this threat, creation of proper land use planning techniques can offer the fastest and the most feasible solution to the loss of forest products.
- Proper funding and encouragement in the forest research areas can be beneficial to assess the present state of scenario and then further to combat against such threat issues.

- Conservation, wildlife, forest, and nature protection agencies among other environmental programs can join together with a common goal of preserving, restoring, and protecting forests to ensure permanence of the world's natural resources.

Conclusion

The productive function of forest resources specify the socioeconomic value of forest resources to local communities dependent on forests as well as national economies. Forests are major source of livelihood especially in mountains. Forests provide timber, fuel wood, fodder, food (wild fruits, vegetables, etc.), raw materials for wood based industries like paper and pulp, sports goods, furniture, match boxes, etc. and miscellaneous products like resin, gums, oils, medicines, Katha, honey, etc. Forests also have ecological significance as they regulate global climate and temperature, carbon levels, conserve soil, maintain moisture in the atmosphere and provide hydrological services like water quality and water flow which are one of most valuable ecosystem services. In addition to this they provide abode to many functional food chains. Actions and strategies to address forest degradation drivers should take into account the potential impacts on food security, local livelihoods, and climate-change mitigation and adaptation. Priority should be given to improving governance; increasing transparency, capacity and law enforcement; providing secure, equitable tenure; and combating illegal activities. Interventions should consider both direct and underlying drivers and scale (e.g. local, national or global) and include a mix of measures.

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