

# SUSTAINABLE MOUNTAIN DEVELOPMENT IN UTTARAKHAND

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## ABSTRACT

Traditional knowledge applied in agriculture and in preserving bio-diversity of Uttarakhand has helped most of the mountain people to survive the adverse climatic conditions over the years. Uttarakhand Himalaya is blessed with rich flora and fauna but it is under increasing pressure from natural activities like earthquakes, avalanches and glaciers, landslides and soil erosion etc., and from man made activities like various construction related works, population pressure, land and forest degradation, loss of bio-diversity, water-scarcity, forest fires and above all inadequate planning at the government level. Uttarakhand has considerable hydropower potential besides tourism, agriculture and horticulture, dairy development, Information technology and biotechnology as main areas of development and generating employment activities for sustainable mountain development, the main strategy required to be adopted is to apply traditional knowledge for management of natural resources, specifically for watershed development, agriculture management and conservation of soil, protection of forests, planting of those trees which grow naturally as well as cater to the local need of fuel and fodder and are good for water and soil conservation.

**Key words-** Ecosystem, deforestation, desertification, degradation, domesticated species.

## INTRODUCTION

Uttarakhand is situated in the lap of Himalayas, the region which is rich in flora and fauna. It ranges from sub-tropical to alpine types. It falls under the West Himalayan- Biographic zone and is abundant in floral diversity, having economic, medicinal and aromatic significance. Himalayas are a storehouse of gene pool. The United Nations had proclaimed 2002 as the International Year of Mountains (IYM) to increase international awareness on global importance of mountain ecosystem. IYM is an important step towards the long-term process initiated during the Earth

Summit held at Rio de Janeiro in 1992. The major outcome of this conference was Agenda 21 and its Chapter 13, "Managing fragile ecosystem: sustainable mountain development", placed mountain on an equal footing with climate change, tropical deforestation and desertification as a key issue. The programme areas identified in Agenda 21 were: -

-Promoting integrated watershed development and alternative livelihood opportunities.

-Generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems. A healthy watershed upstream helps regulate the hydrology downstream, and ecology and environment locally and globally.

### **Challenges to be faced-**

Despite the richness of ecosystems, mountain areas have one of the lowest per capita incomes in the world. The mountain economies are mostly subsistence based and that too for only a part of the year. As such, household members are compelled to move out in search of employment. In the mountain areas of Uttarakhand, women and children have to bear increasing burdens of agriculture and subsistence activities because of migration of male members. Many areas of the mountains are not easily accessible, limiting the scope of development. The inaccessibility and marginality of mountain areas mean that communities are largely cut off from the pathways of economic growth. Mountain areas lack the productive assets- natural, technical, capital, infrastructural or human and no access to information, technology and markets to help them overcome economic vulnerability. Moreover, mountains are facing rapid loss and damage to natural resources, resulting in further difficulties to households in addressing their subsistence demands.

As mountain environment is essential to the survival of the global ecosystem, proper management of mountain resources and socio-economic development of the people deserves immediate attention. The main concern is forest degradation and loss of biodiversity, which results in land degradation and water scarcity. Overgrazing and forest fires aggravate this condition. The indigenous knowledge of the mountain people is a key to tackle all these problems.

### **Steps for all-round development-**

The first step towards improving the worsening environmental and economic condition of the Uttarakhand Mountains is to replace, the so-called commercially viable trees, by the trees that can cater to the fuel, fodder and other household demands of local people. It has frequently been noticed that the trees like pine (pines roxburghi) have been planted in the most parts of Uttarakhand. This tree is not as eco-friendly as oak (Queerer species) and rhododendron locally called as Banj

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and Burans. Oak forests let the shrubs grow, keep soil fertile and moist and help in water-retention. It is also noticed that landslides and soil erosion generally do not take place in these forests. Moreover, these forests cater to the fuel, fodder and other demands of the local villagers. Thus it is not wise to plant trees of pine-species between the altitudes of 4000 to 8000 ft. where oak species can easily grow. Bamboo forests which generally grow in Dugadda -Lansdowne -Kalagarh areas of Uttarakhand region can easily be grown-up between the altitude of 1000-3000 feet. Bamboo is a very good soil binder and is generally known as poor man's timber. Thus a need to do-away with the non-eco- friendly trees of pine-spices and gradually replacing them by eco-friendly trees is being felt desperately. Apart from this the trees planted for beautification like eucalyptus, populous etc. should also be replaced with local trees.

Planting of local trees like Khareek and Bhimal by the side of small fields should be encouraged which will act against soil erosion and can also be used as fodder. These trees can also act as windbreakers which slow up and deflect the wind near the ground, temper hot winds, and moderate the ill effects of cold winds. They also help check soil blowing that would otherwise sweep topsoil from parts of fields near the windbreaks, and they reduce snow drifting. Garhwal Himalaya is an important source of wild fruit species yet these have not been considered as a source of alternative food products. Even these fruits are rich source of protein, minerals and medicine. The trees of Bedu, Bhramara, Reetha, Amla, Timla and Kafal can be planted at the periphery of the village, from where boundary of local forest begins. These fruit bearing trees should be selected as per their natural altitude and suitability of the soil. The local shrubs like Hissar, Kingod and Karonda etc. can be grown in barren lands. Better public distribution system can definitely increase the income of villages. Efforts can be made at panchayat level to utilize these wild fruits as a source of income, particularly for poor rural inhabitants and unemployed youths. They can be demonstrated the simple techniques of preparing jam, jelly, juice, squash, sauce, etc. In Pauri, Almora and other hill stations of Uttarakhand, the squash of Burans flower (rhododendron) is very popular and is being marketed also with the help of government agencies. Similarly, the local villagers in buffer zone of Nanda Devi Biosphere Reserve practice medicinal plant cultivation and this is in tune with the conservation oriented land uses. The efficacy of resource use. and economic returns indicate how such low volume, high value crops have potential for economic betterment of local people.

The 'Chipko Andolan' started in Kedar Valley and 'Beej Bachao Andolan', originated from Jardhargaon of Tehri District of Uttarakhand, reflect awareness of mountain people towards importance of trees and application of traditional knowledge for devising more sustainable ways of

farming. In the wake of Green Revolution of the 1960s in India, Uttarakhand farmers also started using high yielding variety of seeds along with fertilizers and pesticides. But despite increasing investments and inputs, soil fertility and productivity both began to decline slowly. This realization again initiated a movement towards traditional and more sustainable ways of farming. In Jardhagaon itself, most villages switched to organic farming, which produced good yields which were testier and more nutritious and at the same time saving on the costly chemicals. The Beej Bachao Andolan also restored the agro-biodiversity of Himalayan region. This biodiversity includes crop varieties that can survive well in the harsh climatic conditions of the area. Paddy varieties like Jhailda and Jarakhya have the characteristics of withstanding heavy snowfall and can grow in those areas, which have scanty rainfall. Moreover, these varieties are not very susceptible to pests and diseases. The variation in altitudes in Uttarakhand counts for large habitat diversity which makes possible the cultivation of many medicinal and aromatic plant species according to the demand. All these combined with the institutional infrastructure in place raise the potential for the formation of a decentralized marketing system which will be based in collective cultivation and post-harvest value addition, controlled by market demands and conservation needs.

### **Conclusion**

Thus, the need of the hour is to gather the traditional knowledge and practices developed by the transhumance society on available plant, animal resources, medicinal herbs and other technologies of high-altitude Himalayas, where resources are scarce. In a region where such intimate relationship between people and local plant resources persist, the conservation of wild life and the preservation of indigenous knowledge and culture are imperative. But, because of lack of income generation and value addition, the traditional specialization of the local people are breaking down. The effect of modernization and urbanization has relegated the traditional systems of medicine, handicraft, farming and cattle rearing further behind. The government should step into revitalize this traditional knowledge and encourage the local people to put the same into practice. This attitude, if employed in farming, planting of trees and small-scale industry, can definitely change the face of Uttarakhand, resulting in more opportunities for the unemployed youths and enhanced revenue from tourism as well.

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