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ECOLOGICALLY SUSTAINABLE DEVELOPMENT IN THE UTTARAKHAND HIMALAYA

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A B S T R A C T

Mountain territories are important ecosystems. They are also a major source of energy, minerals, agricultural and forest products. They greatly influence global and regional climatic conditions. But the fragile ecosystem of the mountains and their vulnerability to the adverse impacts of climate change, deforestation and forest degradation, not only put pressure on the environment but also on the communities dependent on them. Sustainable approaches to development are therefore particularly important in mountain regions. The policies of the mountain region like Uttarakhand have to take into consideration their natural geographic peculiarities, economic potential without neglecting indigenous people and ethnic minorities. By nurturing sustainable development in mountains through promoting policy dialogue, transfer of sustainable technology, innovative financial approaches, strengthening the mountain community, ensuring that mountain issues are prioritized could improve the livelihood of people along with protecting the mountain environments.

INTRODUCTION

The state of Uttarakhand, which lies in the northern Himalayan region of India, is blessed with abundant resources. Most of the northern part of the state is covered by high Himalayan peaks and glaciers. Other parts of Uttarakhand are covered with dense forests that make up the bulk of its natural resources base. Due to its outstanding mountainous regions, the state is gifted with unique ecosystem that is home of rare species and plants. But the climatic changes and human encroachment in the region, a large portion of area is under threat for the biotic community as in the recent past these have resulted in catastrophic floods and landslides in the state. The hilly State, have been facing various challenges on account of very harsh weather conditions, tough terrain, scattered habitations, extensive forest cover constraining availability of land.

The Rio summit of 1992 brought forth *Agenda 21,* which is an environmental action plan for the next century and was an outcome of the United Nations Conference on Environment and Development (UNCED). This international agreement outlined global strategies for cleaning up the environment and encouraging environmentally sound development. Since 1992 the plan of action and the basic architecture for sustainable development has changed significantly. The post Millennium Development Goals period have seen the adoption of Sustainable Development Goals, which are comprehensive and provide a holistic approach to not only combat climate change and environmental issues, but also focuses on gender equality, poverty and hunger, resilient infrastructure, sustainable industrialization and fostering global partnership. Besides government ministries the onus of implementing these goals also lies on scientific community, politician, religious groups, non-government organizations, civil societies and other various foundations. Therefore, engagement and partnership with all the stakeholders along with the commitment to the dialogue, the Sustainable Development Goals can address long term global challenges.

A sustainable development approach can bring many benefits in the short to medium term, not only related to the environment, but also to the entire human system and it basic assets on which the human lives are dependent. Considering the fact that sustainable development is global issue with local solutions, there is a need to articulate national and local development strategies with that of global without compromising on sustainability. A strong egalitarian approach towards sustainability can be achieved by the involvement of not only government but also indigenous people, non-government organization and other stake holders. The environmental safeguards and development are vitally interlinked, and are of urgent importance to the Himalayan states of India. But the frequent occurrence of events triggered by climate change points out disastrous effects of ignoring environmental constraints and therefore sustainable development must be seen as an overarching goal for vulnerable regions like Himalayas. For sustainable development of Uttarakhand, an early and durable solution to the problems, with continuous vigorous implementation and the efficient utilization of resources are essential. It is crucial for development strategy of the state to include natural

resources friendly praxises and account for the good environmental management. This paper analyses the environmental issues of Uttarakhand and the importance attached to sustainable ecosystem. It also examines the various schemes implemented by union government and state government that will enable the state to achieve comprehensive approach.

Study Area

Uttarakhand became the 27th state of the Republic of India on November 9, 2000, which was carved out of Uttar Pradesh. The location of Uttarakhand is between 30°03′N to 30°05'N and 79°19′E 79°31'E. The state comprising of the central Himalaya, is spread over 53,483 square kms and inhabits 1.01 Crore population (Census, 2011).Administratively, it comprises of the divisions of Kumaon and Garhwal, which are further composed of thirteen districts. Kumaon division comprises of districts of Almora, Nainital, Pithoragarh, Champawat, Bageshwar and Udham Singh Nagar while the Garhwal division consists of districts of Uttarakashi, Chamoli, Tehri, Pauri, Dehradun, Haridwar and Rudraprayag(Figure 1). The state has 95 development blocks and 49 tehsils. Uttarakhand borders Tibet to the north, Nepal to the east, and the states of Himachal Pradesh and Uttar Pradesh in the west and south respectively. The present report is based on the analysis of information and data from research papers, official document and articles.

Figure 1 Location map of Uttarakhand [Source: *mapsofindia, 2013*]

Status of Different Sectors

Agriculture

Agriculture and animal husbandry have been and still are the mainstay sustenance and occupations of the human coterie in the Himalayan state of Uttarakhand. About 80% of the population of the state is dependent on agriculture for its livelihood. The proportion of irrigated area to the sown area is only 11% in the hilly districts whereas it is 90% in the plain districts and tube wells and canals form the major source of irrigation.. The major crops produced in the state include rice, wheat, barley, corn, ragi, etc. The state is a major supplier of fruits like mango, apple, citrus fruits, plum, lychee, naashpati etc (Tuteja, 2013). Uttarakhand is known for its horticultural crops, which include off-season vegetables, floriculture crops, medicinal and aromatic plants. But there are several challenges faced across Uttarakhand like the vagaries and unpredictability of changing climate, forest fires, and landslides. The soil is acidic and poor in plant nutrients and is made up of sandy material due to which they do not retain water for long time. Due to unavailability of moisture in the soil, the crop productivity is not very good in the region. Also, due to variation in altitude the rainfall also differs from place to place effecting the crop production.

The urgent need to enhance the organic productivity of the state was realized, which led to the development of Uttarakhand Organic Commodity Board (UOCB), a nodal agency of the Government of Uttarakhand for promotion of organic farming, was registered under the Societies Act in May, 2003. Projects like "Himotthan Pariyojna", funded by the Sir Ratan Tata Trust was recognized by the state and anchored within the Board. The programme is to encourage rural livelihoods and natural resource conservation, sustainable water availability, livestock and market development, sanitation and natural resources management (Tata trusts). Krishi Vigyan Kendra, Gwaldam is actively involved in proving service to the farmers community of district chaomli, where it provides training programmes, awareness programmes, front line demonstration, on farm testing according to location specific crop etc (Figure 2).Other project like Saturation of Selected Block (SSB) under UOCB, which is being carried out with an aim to target organic villages in specified blocks. The SSB project is to bring about bio-villages with the complete package of practice for agriculture, horticulture and animal husbandry. The state government is also developing organic farming blocks, where over 1500 farmers are registered with the Uttarakhand Organic Commodity Board (UOCB).

Figure 2 Krishi Vigyan Kendra, Gwaldham providing service to farmers. [Source: *Krishi vigyan Kendra, Gwaldham,2013*]

The economic survey of 2014-15 marked that makeover of Indian farming could happen through Horticulture. Horticulture is also vital for the economy of Uttarakhand. Schemes like Mission for Integrated Development of Horticulture (MIDH) under Horticulture Mission for North East and Himalayan States (HMNEH) is being implemented in the state. However data show that the state's share in the total area under fruits and vegetables in the country was 3.55 per cent and 1.07 per cent respectively, whereas yield was only 1.35 per cent and 0.90 per cent (Tuteja, 2013). Bees are very important to humans for at least two reasons -pollination and honey. The Apis cerana Himalaya commonly referred to as the Himalayan hive honeybee is normally reared in the state. It is to be noted that beekeeping and honey culture is an important tool and has a great self-help potential for poverty alleviation and social upliftment of poor people, tribals, landless labourers etc. Honey has great food value and beeswax which is in great demand due to its huge cosmetics usage, provides good cash income. During the 8th Five Year Plan a scheme called "Development of Beekeeping for

Improving Crop Productivity" was launched, apart from this various policies have been framed by the government to enhance the bee keeping activities. In 2006, National Bee Board was reconstituted with an objective to promote scientific bee keeping. The board also provides entrepreneurship for unskilled labour, technology transfer through trainings, seminars, etc financial support to marginal and small farmers. But under the schemes in operation for horticultural development in the Uttarakhand state only 1.87% of the investment were done in bee keeping projects (2012-13), whereas other components like technology transfer, production, training and demonstration were not upto the mark. Therefore, urgent attention should be provided not only in bee keeping sector but also in fruits/vegetables, nursery development, seeds and medicinal plants development in order to achieve a holistic success in horticultural development in the state.

Sustainability in agriculture can be achieved by efficient and optimum use of land, water, livestock, plant genetics, forest and rainfall. Sustainable promotion of agriculture can help improve livelihoods for several mountain farming families and in order to minimize city migration of rural people for better livelihood, there is a dire need to increase the employment in their areas through agriculture without compromising in environmental and social factors.

Tourism

Tourism is emphatically important in Uttarakhand's economy as it brings a net inflow of money. Lying in the north of the vast and profuse expanses of India, and cradled in the breathtaking beauty and serene Himalayas, Uttarakhand, the Devbhomi has attracted people for not only pilgrimage but also for beauty sites, adventure tourism, eco tourism, cultural tourism, health tourism, wildlife tourism etc.(Sati, 2013). The creation of an attractive, viable and sustainable tourism environment focuses on but not limited to conservation of natural resources, to conserve and cherish the value of local traditions, customs and cultural heritage. The need to promote ecologically sustainable tourism has been felt by both the Government and Non Governmental Organizations. The Government is involved in to spread the information in an attempt to encourage ecologically feasible tourism. A regulatory framework has been developed under Bharat Darshan and Atithi Devo Bhavah, now known to the world by the name of Incredible India campaign. The 12th Five Year Plan focuses on inclusive growth, which can be achieved through Sustainable tourism. Schemes like bio- degradable toilets and initiatives of the new central government like Swatch Bharat Mission, Ramayan Circuit, Desert Circuit, Eco Circuit, Wildlife Circuit and Rural Circuit are few steps to improve existing tourism products which can help to build stronger relationships with land and heritage managers and communities. For development of tourism infrastructure in the country, schemes like Prasad: Pilgrimage Rejuvenation and Spiritual Augmentation Drive and Swadesh Darshan: Integrated Development of Theme-Based Tourist Circuits have been inducted. In a view to promote ecotourism in Uttarakhand, Uttarakhand Forest Department has an ecotourism wing under it, which promote rural tourism, community based tourism, birdwatching camps, workshops for the ethical practices of nature guiding and nature guide training (Figure 3). Therefore, Uttarakhand Forest Department is involved in striking a balance between the conservation of the fragile Himalayan ecosystem and encouraging responsible nature based tourism.

Figure 3 Ecotourism training being imparted by Ecotourism wing of the Forest Department, Uttarakhand. (Source: *WWF-India, 2012*)

In Uttarakhand, Uttarakhand Tourism Development Board is the highest body to advise Government on all matters relating to tourism in the State. The tourism business in Uttarakhand generated Rs 23,000 crores during 2013-14, however due to catastrophic floods of 2013, the state witnessed approximately 70% fall in tourism business during 2014-15 (Chitravanshi, 2014). Even though the union government is moving towards sustainability and also promoting the state governments towards the same, it is high time that the central government and Uttarakhand government realizes the need to upgrade its tourism policy for a successful tourism, which will not only require the efforts of government but also other stakeholders like Indigenous people, communities, visitors, operators and businesses, tourism organizations, environment and park management agencies, cultural heritage agencies and local, regional or other governments (Ahmed,2013).

Mining

The mining business provides employment opportunities to thousands of people in the hill state. The Chamoli district of Uttarakhand is famous for housing a number of mineral resources such as quartzite, marble, gneiss, limestone, phyllites, quartzite, sericite-biotite schist and slate (Negi, 1995). The Uttarakhand Forest Development Corporation (UFDC), the Garhwal Mandal Vikas Nigam (GMVN) and Kumaon Mandal Vikas Nigam (KMVN) are the three government agencies which carry out mining.

Figure 4 Minerals collection work in progress-river song (Source: *Uttrarkhand Forest Development Corporation, Government of Uttarakhand, 2007*)

Even though these government agencies are carrying out collection and marketing of minerals in a scientific manner, which has reduced the instances of floods in river but the rights given to private parties often leads to far-flung illegal mining, which not only hurts the government exchequer but also environment (Figure 4).

The geographical and seismic sensitivity of the state does not make it very favorable to mining and reports of illegal mining from different parts of the hill state make the case even worse. The state has also faced various anti-mining movements since 1960s. Therefore, good and effective governance is of prime importance for achieving sustainability in mineral business performance. There are clearly numerous aspects and issues involved in assessing the sustainability of mining, and therefore the government from time to time has constituted various committees to advice on sustainable mining, mining of minor minerals, mining of major minerals, etc. Few of the recommendations include assigning minimum size and minimum period of mine lease, in case of smaller mines lease cluster approach should be followed, etc. True sustainable mining is a difficult task to achieve, as it involves technology, economics, social and environmental areas (MoEF, 2010). Recently, Ministry of Environment Forest and Climate Change, has issued guidelines regarding sustainable sand mining management guideline, which outline the appropriate road map for sustainability. The guidelines are directed to achieve environmentally sustainable sand and gravel mining, to improve the effectuality of monitoring of mining, to ensure rivers are not susceptible to erosion beyond its stable profile, to check depletion and pollution of ground water reserves, etc. The need of the hour is that mining should be subjected to simpler but strict regulatory regime. Granting permits, licenses, and other approvals should be in a fair and transparent manner which requires good governance, a competent and transparent bureaucracy. Alongside focus on community engagement, cross-cultural skills, educating and training employees and contractors, rehabilitation of mining sites in a holistic view to establish sustainable ecosystems.

Energy

Uttarakhand is blessed with renewable sources for generating electricity. However, separation from Uttar Pradesh has brought pressure on Uttarakhand in terms of the development and infrastructure, which is closely linked to energy access. States which relies heavily on coal, that is, finite resources that will eventually dwindle down, alongside will also degrade environment, therefore energy which constantly replenish and never runs out, is what the future demands because energy services have an effect on productivity, health, education, availability of safe water and communication services. According to various sources like Central Electricity Authority, Uttarakhand Jal Vidhyut Nigam (UJVNL), Uttarakhand Renewable Energy Development Authority (UREDA) and Report of Inter Ministerial Group on Ganga basin more than 50 hydropower projects exits in Uttarakhand with the approximate installed capacity of 3595 MW. Even though hydropower is a climate-friendly energy source, generating power without producing air pollution or toxic by-products, but with such large number of hydropower projects and approximately 200 proposed hydropower projects in Uttarakhand, have disturbed the general ecology of the region. Submergence of lands, agricultural fields, forests and houses, massive deforestation threaten the very livelihoods of the poor people. The compensation to such people is generally considered to be inadequate to enable them to lead an acceptable life. Therefore there is dire need for not only Uttarakhand but all the Himalayan state to cautiously review the project and to bring them under environmental governance. All projects above 1 MW should have credible environmental or social impact assessment with transparent and accountable process along with assessment at the impact on the disaster potential of the area.

Uttarakhand has good potential of solar power, in attempt to promote solar power generation in the state; the Uttarakhand Renewable Energy Development Agency (UREDA) has developed schemes to promote grid-connected rooftop and small-size solar PV power plants (Figure 5). New solar plants are being set up to produce 44 MW of electricity (Kumar, 2016).

Figure 5 A rooftop solar project at pithoragarh set up by Uttarakhand Renewable Energy Development Agency (Source: *The Tribune,2014*)

Along with solar energy the state also has potential geothermal energy with more than 50 hot springs but not much attention has been given to explore geothermal energy. (Bhardwaj, 2008). It is extremely important for the state to tap the non-conventional renewable energy resources like geothermal energy, solar energy, and wind energy. Efforts should be made to utilize a multi-dimensional approach, interactions among engineers, geologists, and environmental socialist and local inhabitants, improve the existing technology which in future will provide significant economic and environmental benefits.

CONCLUSION

The formation of the separate mountainous state, Uttarakhand, has also led to the demand for economic development of the state. The state government should not neglect the predominant mountainous character of the state and one size fits all model cannot be applied in its development policies. Development of regional cooperative approaches should be identified in the process of sustainable development that concerns both mountainous people and those living downstream. Climatic changes and recent natural disasters in the state, suggest a need to develop responsive strategies and a change in decision making practices, so as to promote sustainable livelihood for mountain people while also incorporating adequate protection and adaptation mechanism for mountain regions. Sustainable regeneration of mountain agriculture, the need to coordinate infrastructure projects across development sectors, linking tourism, education and culture, sustainable mineral production, creating awareness on the climate change issue, develop inclusive networks for sustainable development should form the long term approach

of the state policy. There is need to establish sustainable multidisciplinary framework that will analyze mountain livelihood issues, strategies and relevant policy implications.

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