Sectors Required for Sustainable Development in Hill Districts of Uttarakhand

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Abstract: There is an increased pressure on forests for fuel wood, fodder, litter and timber requirements that is having an effect on the desired level of forest density and productivity of forests. The destruction and degradation of forests are taking a heavy toll on soil and water resources. It is essential to regenerate degraded forest and wasteland. Our vision is to not only maintain and increase these forest cover to the desired levels but also to develop a harmonious and eco friendly relationship between the local people and forests. All the hill districts of Uttarakhand have more than 50% of the area under forest. Thus, many of the livelihood options in these regions depend on forest based products. It has been recognized that state forests and the people dependent on them, are experiencing new types of change, at ever increasing rates. Thus, the policy and institutional framework have to change to the same degree, with the result that systems designed to ensure that all needs for forest goods and services are met, which are currently inadequate. The policies and strategies of the Uttarakhand Forest Departments and other key institutions should be such that they meet the needs of key forest stakeholders and ensure sustainable management of forest resources, integrating forest sector planning with socio economic development. The objective of this article is to identify sectors where hill districts of requirements.

Keywords: Sectors, canopy, stakeholders.

1. INTRODUCTION

Mountains covered in deep forests are said to play a key role in sustainable human development of the Uttarakhand. However, because of the paucity of data based on targeted research, tangible links between mountain forest conservation and human development remain vague [1]. How to achieve economic growth as well as forest conservation is a challenging issue. The hill districts of Uttarakhand are less developed in terms of electricity, health facilities, roads, irrigation etc. The inter district inequality in infrastructure leads to increasing disparity in terms of income and livelihood between the hills and the plains. Low levels of income not only result in low levels of consumption and material deprivation, but also constrain human potential by restricting access to education and health facilities, thereby creating a vicious cycle of poverty. More than three fourth of Uttarakhand's total population depends on agriculture for their livelihood and the economy is predominantly dependent on mountain agriculture. For physical, geographical and environmental reasons, the scope for agricultural policies based on modern input intensive agriculture is severely constrained in the hill regions. The state faces the challenge of promoting livelihoods to retain people through local employment and income generation and to enhance their quality of life. At the same time, the hill districts of Uttarakhand

have tremendous potential. The vast natural resources add to the state's attractiveness as an investment destination, especially for forest based industries.

Forests play an important role in the states economy [2]. Timber, fodder, litter and fuel forms the major produce group, while bamboo, drugs, grasses, gum, resins, etc. constitute the minor produce group. Forests are the major source of raw materials for industries, buildings, railways and other tertiary sectors, but the increased pressure on forests for fuel, fodder and timber requirements has increased the exploitation of forests. This has begun to affect the desired level of forest density and the area under forest, as well as the productivity of forests. To change the economic and social backwardness in these hill districts it is important to adopt a strategy based on long term planning that will take steps to counter all the problems. Thus the objective of the study is to identify sectors where these hill districts have a comparative advantage and prepare a strategy for inclusive growth based on district specific requirements.

2. AGRICULTURE

The majority of the hill people of Uttarakhand are involved in agriculture, although its share in the country's total area and production is very small. The contribution of agriculture to the state's domestic product is about 22.4% and the population dependent on agriculture for their livelihood is about 80%. The development of the hills is primarily linked to the development of agriculture and its allied activities.

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Figure 1: Food grain production in hill districts of Uttarakhand (Source: Uttaranchal at a glance 2006).

People in the hills have been primarily engaged in subsistence agriculture. Figure 1 shows that the production of different food grains in Uttarakhand has increased from 2001-2002 to 2005-2006. Since, the ecosystem of the hill districts is very different from the plains, it was essential to focus on the agriculture of the hill districts of Uttarakhand in a different manner. The low agricultural yield reflects the small size and scattered land holdings, difficult terrain, unfavorable climatic conditions for some crops, lack of or inadequate availability of improved inputs and technology, and lack of marketing facilities. Almost 70% of the land holdings in Uttarakhand are marginal and 18% are small, and the extension of cultivation to this area will be expensive, since it requires extensive work for soil and water conservation, irrigation and reclamation.

3. HORTICULTURE

In addition to staple foods, the hill districts of Uttarakhand have diversified into the production of condiments and spices like ginger, chillies, garlic etc. The area under these is as high as 2275 ha in Almora followed by Champawat (1098 ha) and Pithoragarh (962 ha). The area under fruit cultivation is quite high in Uttarkashi and, in almost all the hill regions, substantial areas are under vegetable cultivation. There is great potential for diversification into oilseeds like sesamum, rapeseed, mustard and soybean that will contribute towards increasing income in the hill regions.

4. IRRIGATION

As much as 90% of the net sown area of Uttarakhand is rainfed. In order to deal with this situation, focus must be on developing rainwater harvesting along with sprinklers and drip irrigation systems (especially for horticultural crops) in all such hilly areas marked by the absence of irrigation facilities. Additionally, appropriate steps must be taken for the restoration of defunct canals, particularly in the hilly regions. People in the mountains have traditionally built shallow depressions for collecting rain water (Chal/Khal). Apart from providing water during the dry season for irrigation and for use by animals, these Chal/Khals also help in recharging springs and streams. Unfortunately, this practice is now gradually disappearing, which has to be revived as a campaign throughout the State.

5. TRANSPORT NETWORK

There is an urgent need in Uttarakhand to address problems with regard to connectivity, particularly of remote and inaccessible areas located in the upper Himalayan ranges. However, there is an equally pressing need to conserve the fragile ecosystem of the hills, which are sometimes undermined by road construction. Therefore, infrastructure development must strike a balance between the need for connectivity and the need for environmental conservation. The major roads in Uttarakhand mostly run from the southern plains to the mid and outer Himalayan ranges high up in the north. These roads run along the river valleys, and their location and direction have in most cases been determined by the strategic defense requirements of the nation, and not from purely developmental considerations.

6. FORESTS

Forests of the state are extremely important as they provide ecological stability, timber, fodder and a variety of other produce to the local inhabitants. The forest area in Uttarakhand is 64.8% even though the vegetation cover is only 43.5%. Over 5411 hectares of forest areas have a canopy density of less than 40%. There is an increased pressure on forests for fuel, fodder and timber requirements that is having an effect on the desired level of forest density and productivity of forests. The destruction and degradation of forests are taking a heavy toll on soil and water resources, making the land less productive and leading to impoverishment of the rural population. It is essential to regenerate degraded forest and wasteland [2]. Our vision is to not only maintain and increase this forest cover to the desired levels but also to develop a harmonious and eco friendly relationship between the people and forests. A large area of degraded land in the state can be reclaimed as most of the land needs only basic water and soil conservation measures and some amount of plantation and protective work. As shown in Figure 2 all the hill districts have more than 50% of the area under forest. Thus, many of the livelihood options in these regions depend on forest based products. There are large tracts of fallow and uncultivable land in the hill regions due to absentee landlords. Barren land can be utilized for non farming activities and land that is left uncultivated due to lack of credit and inputs can be adopted by organizations and clusters and diverted towards high value cultivation. The maximum pasture and grazing land is in Pithoragarh (13%) followed by Bageshwar (12.9%) and Champawat (8%) this is crucial for better fodder availability for livestock in these districts. Champawat also has large tracts of fallow land (0.2%) due to poverty, lack of water and the unremunerative nature of farming (Figure 2). The forest of Uttarakhand are managed with the help of forest department, Van Panchayat forests, sacred groves, joint forest management, privately owned community

managed forests. According to recent estimates, there are about 12,089 Van Panchayats managing an area of 5, 44,965 hectares. The area under each Van Panchayat ranges from a fraction of a hectare up to over 2000 hectares [3]. The better management and performance of forests under Van Panchayats are due to the villager's commitment, the quality of the sarpanch's leadership, and the availability of funds. The active involvement of people in conserving and managing these community conserved forest areas has resulted in high biodiversity along with meeting people's biomass requirements.

7. FOREST AND AGRICULTURE DEVELOPMENT

Agro forestry can play an important role in the rural economy, making it essential to regenerate degraded forest and wasteland. Wasteland can be converted to grow plants, fodder and fuel, barren land can be used for non farm activities, and land that is left uncultivable due to lack of credit and inputs can be adopted by organizations and clusters and diverted towards high value cultivation. Forests are source of fodder which is converted into dung through domestic animals and used to fertilize crops. Then, forest floor litter is collected and composted along with dung to maintain soil fertility of crop fields. This major forest contribution generally goes acknowledged. Carbon trading should be encouraged and carbon credit facility should be given for environment conservation and maintenance.

8. FORESTS AND BIODIVERSITY

Forests are the most important natural resource of the people of Uttarakhand. Besides harbouring hundreds of species of medicinal and food plants, the forests of Uttarakhand hills are also home of several



Figure 2: Land use in hill districts of Uttarakhand, 2004-2005 (Source: Uttaranchal at a glance 2005).

indigenous fauna. Over millennia, the people of the mountains evolved sustainable community based ways of using forest resources. The conversion of this common property resource into a state owned or privately owned resource meant primarily for generating revenue destroyed the close links people had with the forest. As the result, forests were exploited and degraded. This also affected the floral and faunal diversity present in the forest, and led to numerous conflicts between people and animal. In the recent decades, both the state and hill people have come together to experiment with new systems for managing forests sustainably like creation of Van Panchayats and protected areas. In all such cases, the community as a whole has been concerned with protecting the forest from exploitation. Learning from these experiences, new ways have to be devised to ensure that while forests generate the much needed revenue for the hill people, they are not overexploited and degraded.

9. FUEL WOOD

The hill population in the state is heavily dependent on the forests of the region for meeting many of its basic needs. This dependence goes on increases with increasing altitude, as firstly, the increasing cold requires more fuel wood, and secondly, alternatives to forest products start decreasing with altitude. Fuel wood accounts for 90% of the source of domestic energy in the region and is especially important for rural people. According to [4] about 631kg of fuel wood is consumed per person per year, irrespective of their socio economic status. 100 trips of an average of 5.30 km are made to collect 56.89 guintals of fuel wood for an average family of 6.6 persons per household. Each trip can take up to 5.5 hours. Latest estimates put the present total demand for fuel wood in the state at 25.04lakh MT annually while, the sustained yield from forest areas is a mere 13.20lakh MT. Environmentalists are divided over the impact that fuel wood consumption has on forests. While, many claim that this is one of the main contributors to the destruction of forests, others contend that industrial demand for wood is the primary cause of such destruction, and that a large part of the fuel wood collected consists of dry twigs and branches.

10. GREEN FODDER

The forests are an important source of green fodder, which supplements crop residues for livestock. Livestock are central to maintaining the fertility of the land. In the process, they return manure to the forests and grasslands they feed upon. The National Biodiversity Strategy and Action Plan (NBSAP) has estimated that each head of cattle consumes around 8kg of green fodder per day. The National Biodiversity Strategy and Action Plan further estimates the requirement for green fodder at 259lakh MT per annum based on the livestock census and the total productivity from forests and pastureland at 43.5lakh MT. Even estimating agriculture lands contribute annually about 8.5lakh MT, the deficit is over 200lakh MT per year, which is met by activities such as heavy lopping of trees, cutting saplings and collecting barks, twigs and branches of trees.

11. AROMATIC PLANT CULTIVATION

The number of farmers engaged in cultivation of aromatic plants in Uttarakhand has dramatically increased from 301 in 2003-04 to 2714 in 2006-07 and the area under aromatic plants has increased ten fold. Also the production of essential oils has increased ten times from 12 guintals in 2003-2004 to 128 guintals in 2006-2007. This positive attitude of farmers towards aromatic plant cultivation is because of the high returns from this crop. Intercropping of aromatic plants with food grains can also help diversify the income basket for small and marginal farmers. Aromatic plants helped farmers generate a revenue of Rs. 35.38lakhs in 2006-2007. Farmers can derive huge benefits by diversifying into the cultivation of aromatic plants. Although the productivity of land in the hills is very low, there is a huge demand and ready market for aromatic plants (Herbal Research and Development Institute, HRDI).

12. NON-TIMBER FOREST PRODUCTS (NTFPS)

Non timber forest products (NTFPs) play vital role among the hill people and provide a source of income and subsistence living. NTFPs like fuel wood, medicinal plants, wild edible vegetables, house building materials etc. are integral part of day to day livelihood activities. Since the early 1990s the role of NTFPs for sustainable forest use and poverty alleviation has received increased attention [5]. The forest biomass is harvested for several NTFPs, largely by local communities for daily uses [6]. Hills are particularly known for medicinal plants, which have contributed considerably to the development of India's celebrated medicine system. Apart from medicinal plants, resins, honey, jhula, Gichhi, wild fruits, dwarf bamboo, mushrooms are widely collected and extracted from these forests [5]. The pine resin collection and trade is largely managed by state forest departments. Attempts have been made to regulate and control medicinal plants trade, though not successfully. However, NTFPs collections have



Figure 3: Livestock in hill districts of Uttarakhand (Source: Uttaranchal at a glance 2003).

only a marginal impact on local people's economic condition.

13. ANIMAL HUSBANDRY

Animal husbandry plays a crucial role in the hill economy of Uttarakhand. The livestock population in the state stands at over 46lakhs (Figure **3**). The huge livestock population of the state is central to maintaining the soil fertility. The close integration of livestock, available forest resources, and crop production allows this local subsistence system to have many advantages over more modern systems in which livestock and crops are separated into watertight compartments. However, with only 13% of the total land in the state available for cultivation, combined with deforestation and increasing human, the huge livestock population can cause severe stress to the environment.

14. INSTITUTIONS FOR MARKETING OF FARM PRODUCE

The hill areas have a comparative advantage in the production of horticultural products including fruits and vegetables. The bottleneck in this regard is the absence of a modern marketing infrastructure. The large capital and informational requirement necessary to carry out the marketing activities efficiently implies that only a large organization is suitable for this activity. This requirement can be fulfilled by setting up a Horticulture Marketing Board preferably in a publicprivate partnership mode.

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