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# Development Strategy for the Hill Districts of Uttarakhand

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## Foreword

Within Uttarakhand, there is marked inequality between the hills and the plains. The hill districts palpably lag behind. Therefore, a well thought development strategy is needed to reduce this gap between the two regions. A development vision for the state should include both human and economic aspects along with environmental conservation. Also crucial for social development is the development of women, youth, and children. Therefore, to change the situation of economic and social backwardness in the hill districts, it is important to adopt a well articulated strategy that on the one hand pursues a clearly stated vision and on the other offers practical suggestions to move forward in the given context of Uttarakhand. This study makes such an attempt.

This study recommends measures for addressing the critical constraints on achieving rapid and inclusive growth, identifies sectors where hill districts have a comparative advantage, and suggests policies to exploit this comparative advantage. The study also recommends that the development strategy for Uttarakhand hills could be based on developing an ecological brand equity under the slogan of building Uttarakhand as an **Organic Green State**.

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**Abstract**

Uttarakhand, in spite of being a small state, has certain key features that make it distinct from other states of the country and highlights its potential for development. However, development has predominantly been in the plains, and the hill districts have been left behind. All the hill districts have subsistence farming as their main economic activity. Due to subsistence livelihood, migration and a remittance economy operate in the hill districts. They are land-locked with huge distances between the markets and resources. Because of these constraints, traditional agriculture cannot be the lead sector for development. Thus the state faces the challenge of promoting livelihoods to minimize migration through local employment and income generation, and to enhance the quality of life of people living in villages.

The positive features of these hill districts are that they have enormous potential for tourism, a suitable climate for high-value agriculture, and a pleasant environment due to 60 pert cent forest cover. These have to be harnessed for a development strategy. The development strategy for Uttarakhand hills should be based on developing brand equity under the name of **Organic Green State** and an Uttarakhand Brand Equity Fund should be set up. This can be achieved by working towards this common goal through infrastructure development, tourism promotion, agriculture diversification, poultry- and wool-based livelihoods, and SMEs based on the above that capture linkages with industry and tourism.

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***Key Words****: Uttarakhand, Development Strategy, Organic Green State*

***JEL Classification****: R11, R38*

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# Development Strategy for the Hill Districts of Uttarakhand

## 1. Profile of Uttarakhand

### 1.1 Background

Uttarakhand State was carved out of the state of Uttar Pradesh on November 9, 2000. It is divided into two broad regions--Garhwal and Kumaon. The state is comprised of 13 districts, namely, Chamoli, Pauri, Tehri, Uttarkashi, Dehradun, Haridwar and Rudraprayag in the Garhwal region and Nainital, Almora, Pithoragarh, Udham Singh Nagar, Champawat and Bageshwar in the Kumaon region. Of these 13 districts, four districts (Nainital, Haridwar, Dehradun and Udham Singh Nagar) have large areas in the plains, whereas the other nine districts comprise the hill region of the state. The state is further split into sub-divisions and development blocks (Appendix 1).

The formation of the new state had to fulfill the high expectations of the local people related to development and better living standards. However, within Uttarakhand there is a geographical inequality between the hills and the plains that divides the state critically. Districts in the plains are far ahead on various development indicators. In 2006-07 the state GDP grew by 10.15 per cent, the manufacturing sector grew by 17 per cent and the share of the primary sector has shrinked by 2.7 per cent. Industries have created about 2.8 lakh jobs but these are in the plains, and most of the growth due to industrialization has been restricted to the plains.

The hill region districts are less developed in terms of infrastructure, i.e., electricity, roads and irrigation. 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-fourths of Uttarakhand's total population depends on agriculture for their livelihood and the economy is predominantly dependent on mountain agriculture. However, the land holdings are small and fragmented, and irrigation facilities limited. Soil and water conservation is another issue for inclusive development. For physical, geographical and environmental reasons, the scope for agricultural policies based on modern input-intensive agriculture is severely constrained in the hill regions. As a result, the majority of the rural population in the hills either survives on subsistence agriculture or migrates to other parts of the country for employment. 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 tourism and agriculture- and forest-based industries. Uttarakhand is the first state in the country to have created a Tourism Development Board by legislation. Also, it is the first one to be called an organic state.

This study proposes a strategy for a planned approach to rapid and inclusive growth of the hill districts. The development of agriculture and an agriculture-based system that is linked with the growth of industries and tourism can be the way towards inclusive development of the hill regions. This, along with a watershed approach, is proposed as an efficient way to improve land productivity and sustain it. New opportunities are available through the use of quality seeds suitable for hill agriculture and multi-cropping systems combined with animal husbandry through cattle rearing, poultry, fishing, bee-keeping, etc. Organic farming and agri-based employment opportunities need to be encouraged. The processing of fruits and vegetables, vocational training for youths, and banking and insurance in the service sector can provide livelihood security and support. Development of all these areas along with infrastructure development and better education facilities can be a direction for sustainable development of the hill regions for better quality of life to the inhabitants and to help halt migration from villages.

### 1.2 Economic Profile of Uttarakhand

The state of Uttarakhand encompasses a geographical area of 53,483 sq. km which accounts for only 1.63 per cent of India's area. The state contains about 4.53 per cent of India's forest area and about 3.1 per cent of India's agricultural area (Table 1). 43.6 per cent of the agricultural area is under irrigation as against the national average of 40.3 per cent and average rainfall is also above the national average. The ratio of irrigated area in the hills and plains is 10.2: 88.8 in Uttarakhand (Ref: DACNET)

**Table 1 : Geographical indicators, 2006**

| Indicators | India | Uttarakhand |
|---|---|---|
| Total Geographical area (sq. km.) | 3287240 | 53483 (1.63%) |
| Area under forest (sq. km.) | 765210 | 34651 (4.53%) |
| Area under agriculture (ha) | 183016000 | 5671704 (3.10%) |
| Area under irrigation (%) | 40.3 | 43.6 |
| Average annual rainfall (mm) | 1432 | 1547 |

*Sources: Indiastat (www.indiastat.com) and Uttarakhand at a Glance, 2006-07 (Govt. of Uttarakhand)*
*Note: Figures in parentheses are the per cent share of India.*

**Table 2 : Per cent share of different sectors in GDP at factor cost in Uttarakhand**

*(Unit: in per cent)*

| Sector | GDP (At 1999-2000 prices) | | Average Annual Growth Rate |
|---|---|---|---|
| | 2000-01 | 2006-07 | 2000-07 |
| Primary | 28.19 | 19.45 | -5.16 |
| Secondary | 22.25 | 31.78 | 7.14 |
| Tertiary | 49.57 | 48.77 | -0.27 |
| GDP at factor cost (Rs. thousand crore) | 14.30 | 23.30 | 10.49 |

*Source: Directorate of Economics & Statistics of Uttarakhand and Central Statistical Organization.*

In Uttarakhand the share of the primary sector in GDP has steadily decreased between 2001 and 2007 while that of the secondary sector is increasing (Table 2). Table 3 shows that there has been fluctuations in the growth rate of the state net domestic product both at current prices and constant prices, but over the years these fluctuations have stabilized and is in line with the country's net domestic product.

**Table 3 : Rate of growth of Net Domestic Product at factor cost**

*(Unit: in percent)*

| | | 2000-01 | 2001-02 | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 |
|---|---|---|---|---|---|---|---|---|
| At current prices | India | 7.4 | 8.5 | 7.6 | 12.3 | 12.9 | 13.7 | 15.8 |
| | Uttarakhand | 13.24 | 5.98 | 14.69 | 9.03 | 7.67 | 11.28 | 13.40 |
| At 1999-2000 prices | India | 4.1 | 5.6 | 3.4 | 8.6 | 7.3 | 9.4 | 9.6 |
| | Uttarakhand | 10.28 | 2.98 | 7.16 | 6.27 | 6.20 | 8.24 | 8.55 |

*Source: Directorate of Economics & Statistics of Uttarakhand and Central Statistical Organization.*

According to the 2001 population census, regions in the plains contain 56 per cent of the total state population, whereas the hill regions have around 44.3 per cent. Out of the total state population, 47 per cent of the female population and 42 per cent of the male population reside in the hills, and the remainder live in the plains (Table 4).

**Table 4 : Demographic Indicators, 2001[1]**

| | Uttarakhand | | | India |
|---|---|---|---|---|
| | Hills | Plains | Total | |
| **Total Population (in lakhs)** | 37.61 | 47.28 | 84.89 | 10287.46 |
| Male | 18.21 | 25.05 | 43.26 | 5322.32 |
| Female | 19.41 | 22.22 | 41.63 | 4965.14 |
| Population Growth Rate[2] | | | 1.93 | 2.13 |
| **Population Density**[3] | | | 159 | 325 |
| Sex Ratio[4] | | | 962 | 933 |
| Crude Birth Rate[5] | | | 20.9 | 23.8 |
| Crude Death Rate[6] | | | 7.4 | 7.6 |
| Infant Mortality Rate[7] | | | 42 | 58 |
| **Literacy Rate Total**[8] | | | 71.6 | 64.8 |
| Male | | | 83.3 | 75.3 |
| Female | | | 59.6 | 53.7 |

*Source: 2001 Census.*

[1] District level details are presented in appendix 2.
[2] Ratio of the difference between the population at the beginning and end of a period relative to the population at the beginning of the period, expressed as a percentage. This is for the period 1991-2001.
[3] Number of people per square kilometer.
[4] It is the number of females per 1000 males in the population. It is expressed as 'number of females per 1000 males'.
[5] Rate of births among population of 1000.
[6] Rate of deaths among population of 1000.
[7] The number of children dying under one year of age divided by the number of live births that year. (infant mortality rate is based on a three-year period, 2004-06).
[8] It is the percentage of literates to the total population age 7 years and above.

Uttarakhand is sparsely populated compared to the national figure and the sex ratio is better than the national average. The health indicators do not portray a better figure than the national average but are still better than in many states.

### 1.3 Literature Review

There are a not many research papers and books that have tried to identify growth and development in Uttarakhand in the 7-8 years since the creation of the state. Bisht (2006) argues that the state has to sustain forestry and agriculture for the survival of the people who largely live in rural and hilly areas.

A study by Kar (2007) highlights the importance of equitable growth focusing on GDP growth and distribution of growth to all sections of the population and geographical regions of the country. The study shows that the higher growth rate of the state in the initial years has helped the state to transform itself, but most of the growth has been restricted to the plains, while the hill areas have grown slowly due to structural problems. The development has been mainly in the plain districts of the state and not the hills, which have remained cut off from the rest of the country. Thus, there is a need to modify or reschedule the current schemes according to the hill districts of the state.

It is the geographical inequality between the hills and the plains of Uttarakhand that divides the state most critically. This geographical disparity manifests itself in the form of inter-district inequality, which is most acute in the areas of infrastructure like electricity, roads and irrigation. The inter-district inequality in infrastructure leads to inequality in terms of income and livelihood between the hills and the plains, and results in rampant underdevelopment in the hills while the plains are relatively prosperous. In order to change this situation, the study suggests a strategy that is based on long-term planning. The first step is to identify sectors that impede growth as well as sectors in which the region has a comparative advantage. The current state of infrastructure is clearly a constraint on development in this region and must be the focus of a strategy for inclusive growth. The study identifies priority sectors that need to be developed in order to achieve the goal of inclusive growth; these include infrastructure, health, education, horticulture and tourism.

The state's vision is to include both human and economic development (Dewan and Bahadur, 2005), and economic development should be supported with environmental conservation. Crucial for social development is the development of women, youth and children of the society. It is important to address women's development and raise awareness through education; the development of youths should focus on further training, providing employment opportunities, and making then self-reliant. They should be able to get both self-employment and wage employment. Children are the future of the state and thus their education must be emphasised. This will also help reduce and eradicate poverty in a phased planned manner. To improve the social conditions of the state, attention should be paid to indicators, such as health conditions, water availability, electricity, sanitation, and infrastructure (roads, markets, telecommunications, etc.). Agricultural productivity and movement from a traditional to a modern system are crucial for growth and development of the state and districts.

Sekhar (2007) found that women's participation in the rural economy is significant. In Uttarakhand, young men generally migrate to the plains in search of employment, whereas women are left behind to cultivate the land and take care of the children and the older generation. One option to reduce the drudgery of women in agriculture is to identify alternative economic activities that are viable given the economic, social, and institutional constraints. The study highlights seven economic activities–dairy farming, mushroom cultivation, bee-keeping, quilt-making, poultry farming, papad-making, and petty business. As alternate/supplementary economic activities, the last three, namely, poultry farming, papad-making, and petty business contribute more than 50% to household income. These activities provide a level of income higher than the poverty line income of the region.

Malhotra (2005) shows that forests play an important role in the state economy. Timber and fuel form 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. However, large areas of degraded land in the state can be reclaimed since most of the land needs only basic water and soil conservation measures and some amount of plantation and protective work. HIMCON, a voluntary organization, is working on these issues.

The study describes how environmental legislation has slowly taken away the traditional livelihoods of vast numbers of people. Wood carvers, whose handiwork can be seen in the traditional houses, have disappeared over years, nomadic sheep and goat herders are slowly dying out and now wool has to be brought from Ludhiana; weavers find it difficult to compete with machine-made goods; and agriculture is back-breaking work that does not yield enough for subsistence. The new jobs and opportunities are concentrated in a few urban areas that are administrative centres. These jobs often need knowledge, skills, and capital that are difficult for a local person to obtain.

The study by Pai (2005) focuses on the role of Van Panchayats. About 70 per cent of the total forest land area of the state is under the forest department, but 11 per cent lies with the Van Panchayats. At present, there are 6,777 Van Panchayats managing an area of 5,241 sq. km. of a total forest area of 34,662 sq. km. in the state. The better management and performance of forests under Van Panchayats are due to .the villagers' commitment, the quality of the sarpanch's leadership, and the availability of funds. The programme covers all categories of forest areas, i.e., reserved, protected and panchayati. It is an attempt by the government to encourage community participation even in forests that are not under the jurisdiction of Van Panchayats. Women, who are the backbone of the rural economy but have been marginalized in the process of decision-making and implementation, are given due importance both in the Joint Forest Management Program (JFM) and the National Forest Policy. Women are more intimately related to and dependent on forests, because they .spend a lot of time collecting fuel and fodder from forests, fetching water, and looking after cattle. One of the objectives of the JFM has been to ensure active and effective participation of village women right from conceptualization to the implementation stage.

Kumar (2005) has examined the potential of micro-hydropower in Uttarakhand. Apart from its large and medium hydropower potential, which is estimated to be 20,000 megawatts, Uttarakhand also has enormous potential for small, mini- and micro-hydropower generation. The overall hydropower potential of the state is estimated as 40,000 megawatts, which is half the additional power projected to be realized during the next two decades for the entire country. Surveys show that about 20 per cent of the total number of villages in the state are yet to be electrified. The per capita power consumption of the state is much below the national average, which itself is very low by international standards. The low per capita power consumption level is attributed to the high level of poverty, the unregulated supply of power and the un-electrified marginalized areas. The hydropower potential of Uttarakhand can be harnessed for its development and to raise the quality of life of its people. Hydro-electric power generation provides electricity at a cheaper price and in an environment-friendly manner. This crucial price advantage of hydropower-based electricity may act as a catalyst for the economic development of the state and its people by increasing their purchasing power. Hydro-electric power can be a boon in sectors of the state economy, such as agriculture, fiber-processing, and tourism. Though there are problems related to the financial viability of such decentralized power generation by the public sector, non-government community efforts have proved it to be a success. A national-level NGO, Foundation for Rural Recovery and Development (FORRAD), has assisted in setting up two community-owned hydropower stations of 20 kw in Tehri-Garhwal district. Poor people, who cannot afford electricity under government schemes, contribute labour and marginal cash as part of a community effort to gain access to reliable and cheap electricity.

On the regeneration and conservation of forest resources, Dewan and Singh (2005) say that the forest department of Uttarakhand has not been able on its own to protect the forests and their bio-diversity. 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.

### 1.4 Government Initiatives

A review of the plans for hill states reveals that the main emphasis has been on the development of infrastructural facilities and social and community services during both the Fifth and the Sixth plan periods. This thrust was necessary to cover the backlog in infrastructural facilities. Production sectors and sectors that have a direct bearing on ecological preservation and restoration received less attention; these sectors were given attention during the Seventh Plan period.

The Annual Reports (since 2001) of the Planning Commission, Government of India, show that special programs were designed for the development of the hill regions. The Special Area Program of the Annual Plan 2000-01 focused on the implementation of the Hill Area Development Program (HADP). Special central assistance under the program was provided as a 90% grant and 10% loan. The funds available under HADP are divided among the designated hills areas[9] covered under the program. The main objectives of the program are eco-preservation and eco-restoration with an emphasis on preservation of bio-diversity and rejuvenation of hill ecology. For the hill

[9] Designated hill areas of Assam, Tamil Nadu, Uttar Pradesh/ Uttarakhand and West Bengal.

areas covered under HADP, a sub-plan approach has been adopted. The concerned state government prepares the total plan consisting of flow of funds from the state plan and special central assistance made available under HADP. In its 49th meeting, the National Development Council (NDC) discussed placing Uttarakhand on the list of special category states. The Planning Commission had initiated a programme for preparation of State Development Reports which includes many states including Uttarakhand. During the year, a note for the cabinet on "Granting of Special Category State status to Uttarakhand" was sent to the Cabinet Secretariat to be placed before the Cabinet for its consideration. An agenda paper to make Uttarakhand a special category state was prepared for the full Planning Commission meeting. A note on setting up the first State Finance Commissions (SFCs) of the newly-created state of Uttarakhand along with many other states was also prepared.

The Department of Elementary Education and Literacy implemented the Mahila Samakhya (MS) Program in 1989. This program recognizes the centrality of education in empowering women to achieve equality. Adopting an innovative approach which emphasizes the process rather than mere fulfillment of targets, it seeks to bring about a change in women's perceptions about themselves and society's perceptions with regard to the traditional role of women. The effectiveness of the Mahila Samakhya strategy has resulted in its being adopted by other basic education projects. Several evaluation studies have shown that the MS program has helped generate a demand for literacy, given women the strength and ability to demand accountability from government delivery systems, increased women's participation in Panchayati Raj bodies, and created an awareness of the need to struggle for a gender-just society. Disaster Management and Natural Calamity Relief programs have also been launched under the state plans. The National Rural Health Mission (NRHM) was launched in April 2005 (in the Tenth Plan) for a period of seven years (2005-12) with a view to bringing about dramatic improvement in the health system and the health status of people in the country. The Mission seeks to provide universal access to equitable, affordable and quality health-care, which is accountable and responsive to the needs of the people, reduction of child and maternal deaths as well as population stabilization, and gender and demographic balance.

The Annual Report 2008-09 of the Planning Commission, Government of India highlights the continuous state emphasis on the development of the social sector. This is also clearly reflected in both the Eleventh Plan and Annual Plan proposal. Over 37 percent of the plan outlay would be ear-marked for social services. Further acceleration to develop infrastructure -- roads and bridges, urban infrastructure, power and tourism development with the help of external aid -- has been proposed. One of the major concerns expressed by the state government is the remoteness and inaccessibility of the interior hill regions. As such areas constitute more than 50 per cent of the total land areas of the state, the government has laid its prime emphasis on construction of roads and bridges across the state and improvement in the transportation sector. Some gray areas like agriculture, soil quality, hydro-electricity, health and education have also been highlighted. The scope for improving organic farming in Uttarakhand, and public-private partnership for exploring various avenues of development in the state are under consideration. The new industrial policy of 2008 has been launched with the objective of promoting economic development of the hill and remote areas of the state where industrialization could not take place in the past.

Both industrial and power policies were announced together because these two sectors complement each other.

### 1.5 Vision, Objectives and Plan of the study

In the face of economic backwardness, generating remunerative livelihoods in hill region of the state will help in the development of these nine hill districts. 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 described above. 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. Since the district-level database is not easily available, it has been constructed for all the important development indicators and presented in a tabular form in the study report in the respective sections. The information has been collected from various secondary sources, ministries, directorates, and planning boards, and interactions with stake holders. Interactions with development agencies and their programs are also presented in the form of short case studies.

The vision of the state is to include both human and economic development along with environmental conservation. Crucial for social development is the development of the women, youth and children of the society. Women's development and awareness through education, and the development of youth through more training, employment opportunities and self-reliance are important. They should be able to get both self-employment and wage employment. Children are the future of the state and thus emphasis on their education is a must. This will also help poverty reduction and eradication in a phased planned manner. To improve social conditions in the state it is necessary to improve indicators like health conditions, water availability, electricity, sanitation, and infrastructure like roads, markets, and telecommunications. Agricultural productivity and movement from traditional to modern farming techniques are essential for the growth and development of the state and districts. The identified sectors for development are agriculture, poultry and wool, infrastructure, tourism and Small Manufacturing Enterprises (SMEs) based on these sectors.

Section 2 of the paper discusses the issue of sustaining and developing agriculture and agriculture-based systems. Section 3 highlights the development of small-scale industries and other opportunities to help create employment in the hill districts. Section 4 discusses the way to propagate tourism and Section 5 deals with the issue of infrastructure development. Section 6 gives the conclusion and strategy; it also recommends measures to address critical constraints that hill regions of Uttarakhand face in its rapid inclusive growth.

## 2. Agriculture and Agriculture-Based Systems

### 2.1 Agriculture Profile of Uttarakhand

Agriculture development for Uttarakhand was re-examined when the state was separated from Uttar Pradesh. Since the ecosystem of the hill regions 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 Green Revolution of the 1960s benefited those

areas that already had irrigation facilities, but this was not possible in the hills because of a lack of these resources. Uttarakhand is primarily an agricultural state 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[10] per cent and the population dependent on agriculture for their livelihood is about 75-85 per cent[11]. The development of the hills is primarily linked to the development of agriculture and its allied activities. Since the hills are constrained in the development of large-scale industrialisation, and due to infrastructure constraints the development of the service sector is also constrained, the growth and development of the agriculture sector remains the prime focus.

People in the hills have been primarily engaged in subsistence agriculture. The contribution of Uttrakhand to the country's total foodgrain and sugarcane production is negligible (Table 5). Table 6 shows that the area under cultivation of foodgrains in Uttarakhand has increased between 2000/01 and 2005/06, but production and yields have declined.

**Table 5 : Area, production and yield for selected commodity groups, 2005-06**

| Commodity groups | Uttarakhand | | | India | | |
|---|---|---|---|---|---|---|
| | Area (million ha) | Production (million tonnes) | Yield (kg/ ha) | Area (million ha) | Production (million tonnes) | Yield (kg/ ha) |
| Foodgrains | 1.03 | 1.59 | 1548 | 121.60 | 208.60 | 1715 |
| Coarse cereals | 0.27 | 0.32 | 1188 | 29.04 | 34.07 | 1172 |
| Pulses | - | - | - | 22.39 | 13.39 | 598 |
| Oilseeds | - | - | - | 6.74 | 7.99 | 1187 |
| Sugarcane | 0.10 | 6.13 | 60733 | 4.20 | 281.17 | 66928 |

*Source: Agriculture Statistics at a Glance, 2007.*

**Table 6 : Area, production and yield of foodgrains**

| | 2001-02 | | 2005-06 | |
|---|---|---|---|---|
| | Uttarakhand | India | Uttarakhand | India |
| **Area (million ha)** | 0.98 (0.80) | 122.78 | 1.03 (0.85) | 121.6 |
| **Production (million tonnes)** | 1.71 (0.80) | 212.85 | 1.59 (0.76) | 208.6 |
| **Yield (kg/ ha)** | 1742 | 1734 | 1548 | 1715 |

*Sources: Agricultural Statistics at a Glance, 2007; Fertilizer Statistics.*

[10] Agriculture Statistics at a Glance, 2007.
[11] Malhotra (2005).

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 credit and marketing facilities[12]. The status of operational land holdings[13] in Uttarakhand in Table 7 highlights the small fragmented land holdings in the state. As per the agricultural census, 2001, Uttarakhand's, average land holding trends are similar to the national average. But the overall land holding average is lower than the national average because almost 70 per cent of the land holdings in Uttarakhand are marginal and 18 per cent are small.

**Table 7 : Operational Holdings, 2001**

| Operational holdings | No. of operational holdings (in '000 ha) | | Area operated (in '000 ha) | | Average size of holdings (ha) | |
|---|---|---|---|---|---|---|
| | Uttara-khand | India | Uttara-khand | India | Uttara-khand | India |
| Marginal (<1 ha) | 628 | 76122 | 243 | 30088 | 0.39 | 0.40 |
| Small (1-2 ha) | 158 | 22814 | 221 | 32260 | 1.40 | 1.41 |
| Semi-medium (2-4 ha) | 78 | 14087 | 212 | 38305 | 2.72 | 2.72 |
| Medium (4-10 ha) | 24 | 6568 | 132 | 38125 | 5.50 | 5.80 |
| Large (>10 ha) | 1 | 1230 | 36 | 21124 | 36.00 | 17.17 |
| All holdings | 889 | 120822 | 844 | 159903 | 0.95 | 1.32 |

*Source: Agricultural Statistics at a Glance, 2007.*

With the state's limitations in land and water resources, yields need to be improved through scientific transformation and modernization of agriculture. Thus, the development policies for the agriculture sector of the state in particular have to be oriented towards marginal and small landholders. For sustainable development, additional investment is crucial. The prime objective of the development of the agriculture system is to increase sustainability of this sector in such a manner that it provides a better livelihood option and makes the population dependent on it move from subsistence farming to a well-knit higher-income farming system and alternatives to the farming system in a diversified manner.

In many countries, there is considerable scope for bringing new areas under cultivation, but in India the scope for extension of cultivation to new land is limited.

[12] Dewan and Bahadur (2005).

[13] All land which is used wholly or partly for agricultural production and is operated as one technical unit by one person alone or with others without regard to the title, legal form, size or location.

Already, about 46.3 percent of the total reported area is cultivated. Culturable land (culturable wastelands, other fallow lands, permanent pastures, grazing lands, and miscellaneous tree crops), which is not currently cultivated, is estimated at about 12.5 per cent of the total (Table 8).

**Table 8 : Distribution of Agricultural land by type of use: 2004-05**

| **Characteristics** | **Uttarakhand** | **India** |
|---|---|---|
| Geographical area | 5689 | 328726 |
| Area for land utilization statistics | 5348 | 305233 |
| Forest | 3127 (58.5) | 69672 (22.8) |
| Not available for cultivation[14] | 465 (8.7) | 42301 (13.9) |
| Permanent pastures and other grazing lands | 229 (4.3) | 10430 (3.4) |
| Land under miscellaneous tree crops and groves not included in net sown area | 252 (4.7) | 3385 (1.1) |
| Culturable wasteland[15] | 386 (7.2) | 13186 (4.3) |
| Total of other uncultivated land excluding fallow land | 868 | 27000 |
| Fallow lands other than current fallow land | 71 (1.3) | 10720 (3.5) |
| Current fallow land | 41 (0.8) | 14220 (4.7) |
| Total fallow land | 112 | 24941 |
| Net sown area | 776 (14.5) | 141319 (46.3) |
| Total cropped area | 1289 | 190911 |
| Cropping intensity | 166.1 | 135.1 |
| Agriculture land/Cultivable land /Culturable land | 1527 | 182829 |

*Source: Agricultural Statistics at Glance, 2007.*
*Note: Units in '000 hectares; figures in parentheses are per cent of reported area for land utilization statistics.*

[14] This would include forest area under non-agricultural use, barren and uncultivable land.
[15] The area under culturable wasteland does not represent the area which is really culturable, as it may not be possible to bring under cultivation large parts of the area, except at a huge cost.

Uttarakhand, in contrast, has only 14.5 per cent of its area under cultivation and almost 60 per cent area under forest. Culturable wasteland is around 7.2 per cent. Most of this area is occupied by marginal and sub-marginal lands, and the extension of cultivation to this area will be expensive, since it requires extensive work for soil and water conservation, irrigation and reclamation.

## 2.2 District Profile

When hill districts of the state are examined more closely, agriculture emerges as the main activity of all the hill districts. Since most of the land is covered with forest there is very little scope for diversification. However, some districts have already diversified into alternative farm-based activities like fruits and vegetables, aromatic and medicinal plantations and some have also tried to extract the potential from animal husbandry activities like dairy and poultry. Forest trees also offer an alternative source of livelihood. This section discusses the present trends in hill districts and the constraints, and suggests alternative opportunities available with each district.

The cropping pattern of the hill districts is mainly based on traditional agriculture. Table 9 presents the cropping pattern in each of the hill districts and the production of these crops. In almost all the hill districts, rice, wheat, mandwa, and sanwa remain the main crops with the maximum area under cultivation. The major crops of each districts are highlighted in the table; for example, barley is an important crop for Pithoragarh both in terms of area and production. Production is mainly for self-consumption and distribution in village markets; there is not much statistical evidence of development of mandis and markets to dispose off any surpluses.

As expected, the yields are not very high in Uttarakhand as a whole and also the productivity of the hill districts is generally lower than the state average (Table 10). This is because of the small and fragmented land holdings, low use of quality seeds, limited irrigation facilities, lack of extension and low farm mechanisation. The details of the operational holdings and district-wise average land holdings are presented in Table 11 (actual numbers in Appendix 3). Due to the small size of the land holdings, farm mechanization was not technically feasible. On an average, about two-third of the land holdings are marginal in size with an average land of less than 0.66 ha in all the districts. Specifically, in Bageshwar almost 90 per cent of the land holdings are marginal with 70 per cent of the total area under them. Pauri Garhwal has a better situation with only 50 per cent of the land holdings as marginal and only 18 per cent area under it. The average land holding size in Pauri is also above one hectare (Table 12). Uttarkashi and Chamoli also have a relatively better situation than other hill districts of Uttarakhand.

**Table 9 : Area and production patterns of hill districts of Uttarakhand, 2003-04**

| Crops | Almora | Bageshwar | Chamoli | Champawat | Pauri Garhwal | Pithoragarh | Rudraprayag | Tehri Garhwal | Uttar Kashi |
|---|---|---|---|---|---|---|---|---|---|
| **Area (in hectares)** | | | | | | | | | |
| Rice | 23908 | 10775 | 12210 | 8369 | 25455 | 24190 | 10646 | 15880 | 9884 |
| Wheat | 46220 | 14015 | 15263 | 13015 | 36641 | 30338 | 10663 | 25083 | 15643 |
| Barley | 2873 | 1685 | 1598 | 1275 | 6115 | 13187 | 1286 | 1559 | 175 |
| Bhatt | 1669 | 1421 | 26 | 144 | 3 | 620 | 375 | 38 | 48 |
| Gahat | 190 | 197 | 451 | 764 | 3118 | 1060 | 191 | 2641 | 604 |
| Maize | 5881 | 435 | 8195 | 809 | 3162 | 3828 | 190 | 2211 | 5982 |
| Manduwa* | 34578 | 5770 | 10888 | 8212 | 27096 | 9135 | 6755 | 16693 | 5640 |
| Sanwa* | 14134 | 1536 | 2327 | 1697 | 18503 | 891 | 2471 | 20824 | 2613 |
| Total cereal | 132714 | 38097 | 36931 | 30978 | 52636 | 98370 | 95446 | 77228 | 48033 |
| Rajma | | 36 | 33 | 77 | 384 | 284 | 98 | 864 | 2195 |
| Chana | 31 | 8 | | 36 | 82 | 70 | | 161 | 4 |
| Masoor | 278 | 1384 | 194 | 1140 | 117 | 3876 | 24 | 633 | 240 |
| Urad* | 839 | 745 | 419 | 751 | 3160 | 699 | 230 | 1422 | 593 |
| Arhar* | 5 | 3 | 117 | | 526 | | 49 | 702 | 180 |
| Peas* | 40 | 12 | 9 | 59 | 26 | 116 | 2 | 242 | 342 |
| Total pulses | 729 | 1721 | 1342 | 2313 | 5548 | 5769 | 716 | 7003 | 2868 |
| Total foodgrains | 138064 | 34807 | 52730 | 29916 | 142605 | 86322 | 32251 | 89812 | 42234 |
| **Production (in tones)** | | | | | | | | | |
| Rice | 24487 | 16223 | 15151 | 10678 | 29011 | 31870 | 13947 | 23632 | 16476 |
| Wheat | 31189 | 13639 | 14561 | 21015 | 34091 | 37340 | 11729 | 33895 | 18393 |
| Barley | 2018 | 1876 | 1978 | 1841 | 5557 | 15716 | 1340 | 1557 | 203 |
| Bhatt | 1150 | 853 | 17 | 94 | 2 | 492 | 289 | 13 | 37 |
| Gahat | 152 | 144 | 379 | 588 | 1939 | 864 | 132 | 2113 | 438 |
| Maize | 6569 | 581 | 11382 | 1072 | 4259 | 4743 | 242 | 3804 | 7969 |
| Manduwa* | 27597 | 11139 | 17389 | 13074 | 38013 | 11710 | 9939 | 22846 | 7308 |
| Sanwa* | 11192 | 1568 | 4001 | 2583 | 22546 | 1121 | 2942 | 30340 | 2775 |
| Total cereal | 100192 | 37563 | 38206 | 42813 | 50661 | 118468 | 71680 | 88946 | 58790 |
| Rajma | 0 | 0 | 27 | 0 | 316 | 270 | 23 | 502 | 2469 |
| Chana | 16 | 10 | | 35 | 79 | 43 | | 6 | 2 |
| Masoor | 174 | 731 | 113 | 654 | 80 | 2481 | 16 | 378 | 100 |
| Urad* | 310 | | 174 | | 1311 | 287 | 76 | 590 | 213 |
| Arhar* | | | 88 | | 393 | | 27 | 525 | 90 |
| Peas* | 18 | 17 | 12 | 82 | 36 | 81 | 1 | 335 | 212 |
| Total pulses | 489 | 931 | 748 | 1436 | 2939 | 3678 | 339 | 4780 | 2347 |
| Total foodgrains | 122662 | 43307 | 64527 | 42046 | 153400 | 106578 | 39560 | 125761 | 56985 |

*Note:* Crops have data for the latest available year, i.e, 2002-03.*

**Table 10 : Productivity of major agriculture crops in Kg/ha**

| Commodities | Uttarakhand | Almora | Bageshwar | Chamoli | Champawat | Pauri Garhwal | Pithoragarh | Rudraprayag | Tehri Garhwal | Uttarkashi |
|---|---|---|---|---|---|---|---|---|---|---|
| Rice | 1,746 | 1,022 (C) | 1,407 (B) | 1,274 (D) | 1,169 (C) | 1,091 (C) | 1,317 (D) | 1,488 (A) | 2,434 (A+) | 1,626 (A) |
| Wheat | 1,853 | 1,088 (C) | 1,637 (A) | 1,338 (D) | 1,526 (B) | 1,170 (C) | 1,338 (D) | 1,258 (B) | 1,230 (D) | 1,575 (B) |
| Barley | -- | 1,031 (--) | 1,675 (--) | | | | | | | |
| Mandua | 1,383 | 1,177 (A) | 1,474 (A+) | | | 1,403 | | | | |
| Sava | -- | 1,143 (--) | 1,679 (--) | | | 1,219 | | | | |
| Maize | 1,086 | 1,275 (A+) | 1,025 (A) | 1,165 (A+) | 1,539 (A+) | 1,146 (A+) | 1,239 (D) | 962 (A) | 948 (A) | 1,055 (B) |
| Urad | 746 | 415 (B) | | | | 415 | | | | |
| Masur | 746 | 818 (A+) | | | | 818 | | | | |
| Gram | 746 | 972 (A+) | | | | 972 | | | | |
| Potatoes | 15,835 | 22,536 (--) | 22,536 (--) | 22,536 (A+) | | | | | | 22377 |
| Arhar | 746 | -- (--) | | | | 748 | | | | |
| Mustard | 762 | 1,073 (A+) | 1,023 (A+) | | | | | | | |
| Oilseeds | 1,023 | | | 926 (B) | | | | | | |

*Note: Classification: A – D.I. is between 85% and 99.9%; B - D.I. is between 70% and 84.9%; C - D.I. is between 50% and 69.9%; D – D.I. is less than 50%.*
*Sources: Potential Linked Credit Plan, 2007-2008; National Bank for Agriculture and Rural Development (NABARD); Uttaranchal Regional Office, Dehradun.*

**Table 11 : Holdings and areas under different operational holding sizes, 2001**

*(Unit: in per cent)*

| Hill Districts | Marginal holdings | | Small holdings | | Medium & large holdings | |
|---|---|---|---|---|---|---|
| | Number | Area | Number | Area | Number | Area |
| Almora | 77.1 | 49.0 | 17.8 | 32.2 | 5.1 | 18.7 |
| Bageshwar | 90.1 | 69.8 | 8.4 | 22.1 | 1.5 | 8.1 |
| Chamoli | 68.2 | 26.2 | 19.7 | 30.4 | 12.1 | 43.4 |
| Champawat | 75.0 | 43.6 | 18.0 | 31.0 | 6.9 | 25.5 |
| Pauri Garhwal | 50.5 | 18.2 | 28.3 | 30.1 | 21.2 | 51.7 |
| Pithoragarh | 86.5 | 65.5 | 11.1 | 24.0 | 2.4 | 10.4 |
| Rudraprayag | 80.2 | 46.7 | 15.0 | 31.7 | 4.8 | 21.6 |
| Tehri Garhwal | 69.1 | 33.8 | 22.2 | 35.7 | 8.8 | 30.5 |
| Uttarkashi | 67.5 | 21.3 | 17.3 | 27.0 | 15.2 | 51.7 |

*Source: Computed from data available in Uttarakhand at a Glance, 2006-07.*

**Table 12 : Average land holdings in hill districts of Uttarakhand, 2001**

| Hill districts | Marginal | Small | Medium and large | Average |
|---|---|---|---|---|
| Almora | 0.47 | 1.34 | 2.72 | 0.74 |
| Bageshwar | 0.39 | 1.33 | 2.73 | 0.51 |
| Chamoli | 0.36 | 1.43 | 3.34 | 0.93 |
| Champawat | 0.47 | 1.39 | 2.97 | 0.81 |
| Pauri Garhwal | 0.48 | 1.42 | 3.26 | 1.34 |
| Pithoragarh | 0.47 | 1.34 | 2.73 | 0.62 |
| Rudraprayag | 0.38 | 1.40 | 2.96 | 0.66 |
| Tehri Garhwal | 0.42 | 1.38 | 2.97 | 0.85 |
| Uttarkashi | 0.30 | 1.49 | 3.26 | 0.95 |

*Source: Computed from data available in Uttarakhand at a Glance, 2006-07.*
*Note: Units in hectares*

## 2.3 Agriculture Sub-Sectors

The majority of Uttarakhand agriculture is rainfed and there is not much surplus for the market. As a result most of the able-bodied men have migrated to other places in search of employment. Only women are left in the hills and they have started looking after the farms. The challenge is to change this structure and create employment through agriculture. This could be done by diversifying the agricultural pattern so as to create alternative income and better living standards. The alternative areas of diversification are towards horticulture crops, spices and condiments, tea plantations, and herbal and medicinal plants. Development of organic farming is another option for agriculture-based hill regions. Development of animal husbandry and forest resources are already a part of hill livelihood, which has limitations on its further expansion.

### *2.3.1 Horticulture*

In addition to staple foods, the hill districts of Uttarakhand have diversified into the production of condiments and spices like chillies, ginger, and garlic. The area under these is as high as 2275 ha in Almora, 1098 ha in Champawat and 962 ha in Pithoragrh (Table 13). Some areas in Pauri grow sugarcane also. The area under fruit

**Table 13 : Area under other crops (ha), 2003-04**

| Commodities | Almora | Bageshwar | Chamoli | Champawat | Pauri Garhwal | Pithoragarh | Rudraprayag | Tehri Garhwal | Uttarkashi |
|---|---|---|---|---|---|---|---|---|---|
| Sugarcane | | | | 17 | 18 | | | | |
| Other sugar | | | | | 10 | | | | |
| Total Sugar | | | | 17 | 28 | | | | |
| Chillies | 1865 | 109 | 180 | 569 | 703 | 440 | 116 | 490 | 88 |
| Ginger | 69 | 8 | 6 | 282 | 27 | 107 | | 216 | 1 |
| Garlic | 170 | 21 | 49 | 126 | 41 | 198 | 15 | 35 | 11 |
| Other condiments & spices | 171 | 84 | 89 | 121 | 34 | 217 | 12 | 17 | 23 |
| Total condiments & spices | 2275 | 222 | 324 | 1098 | 806 | 962 | 143 | 758 | 123 |
| Mangoes | | | 2 | 48 | 56 | | | 5 | |
| Citrus fruits | | | 7 | | 1 | | | | 2 |
| Apples | 67 | | 1 | | 1 | | 4 | | 419 |
| Others fruits | 34 | | 3 | 12 | 14 | | 6 | | 78 |
| Total fresh fruits | 101 | | 13 | 62 | 72 | | 10 | 5 | 499 |
| Dried fruits | | | | | 1 | | | | 5 |
| Total fruits | 101 | | 13 | 62 | 73 | | 10 | 5 | 504 |
| Potatoes | 854 | 433 | 2500 | 742 | 612 | 667 | 124 | 1313 | 2148 |
| Onions | 286 | 152 | 51 | 227 | 481 | 287 | 22 | 126 | 25 |
| Others vegetables | 1844 | 174 | 101 | 1173 | 237 | 1693 | 30 | 1081 | 235 |
| Total Vegetables | 2984 | 759 | 2652 | 2142 | 1330 | 2647 | 176 | 2520 | 2408 |
| Total Fruits and vegetables | 3085 | 759 | 2665 | 2204 | 1403 | 2647 | 186 | 2525 | 2912 |
| Total food crops | 130245 | 38917 | 51840 | 40796 | 122434 | 85655 | 31006 | 96917 | 39965 |
| Sesamum | 177 | 23 | 27 | 33 | 116 | 21 | 17 | 463 | 676 |
| Rapeseed & mustard | 483 | 61 | 532 | 516 | 505 | 530 | 340 | 1270 | 997 |
| Soybean | 319 | 60 | 249 | 139 | 348 | 1343 | 70 | 580 | 99 |
| Other oilseeds | 32 | | 33 | 123 | 7 | 40 | 7 | 10 | 3 |
| Total oilseeds | 1013 | 144 | 841 | 812 | 988 | 1934 | 434 | 2323 | 1776 |
| Tea | 1 | 43 | 11 | | | | | | |
| Total drugs, narcotics and plantation crops | 1 | 43 | 25 | 4 | 9 | | 1 | 3 | 1 |
| Fodder crops | | 8 | | 108 | 84 | | | | |
| Other non-food crops | 5 | 68 | 59 | 38 | | | | | 1 |
| Total non-food crops | 1019 | 263 | 925 | 962 | 1081 | 1934 | 435 | 2326 | 1778 |

*Source: DACNET website, Ministry of Agriculture, Government of India.*

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.

### *2.3.2 Herbal and Medicinal plants*

Uttarakhand has observed an increase in the area under cultivation of aromatic and medicinal plants. Table 14 shows that 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 quintals in 2003-04 to 128 quintals in 2006-07. 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.

**Table 14 : Aromatic plantation in Uttarakhand**

| Year | No. of farmers | Area under aromatic plants (in hectares) | Production of essentials (in quintals) |
|---|---|---|---|
| 2003-04 | 301 | 34 | 12 |
| 2004-05 | 587 | 100 | 41 |
| 2005-06 | 1198 | 194 | 74 |
| 2006-07 | 2714 | 382 | 128 |

*Source: Collected from HRDI.*

Aromatic plants helped farmers generate a revenue of Rs. 35.38 lakhs in 2006-07 and created employment of around 1910 (Table 15). Farmers can derive huge benefits by diversifying into the cultivation of aromatic plants.

**Table 15 : Benefits from plantation of aromatic crops in Uttarakhand**

| Years | Revenue generated (in lakhs) | Employment provided (no.) | Districts benefited through training farmers |
|---|---|---|---|
| 2003-04 | 4.07 | 170 | 279 |
| 2004-05 | 11.02 | 500 | 1410 |
| 2005-06 | 21.49 | 970 | 2587 |
| 2006-07 | 35.38 | 1910 | 3050 |

*Source: Collected from HRDI.*

These benefits have been generated with the help of the Herbal Research and Development Institute (HRDI) that works on aromatic plants used in cosmetics, soaps, and perfumes. Although the productivity of land in the hills is very low, there is a huge demand and ready market for aromatic plants. . The HRDI has identified areas in selected hill regions where these crops can be grown and adopted a clustered

approach that includes production and processing. Table 16 shows the clusters in hill districts where the HRDI is active.

**Table 16 : Clusters developed by HRDI for herbal and medicinal plants**

| S. No. | Clusters | State-Assisted | Private |
|---|---|---|---|
| 1 | Almoria: Rajwal, Dhali and Jatti | ✓ | |
| 2 | Pauri Garwal: Pokhal and Aita | | ✓ |
| 3 | Chamoli: Joshimath and Gopeshwar | ✓ | |
| 4 | Pithoragarh: Thal | ✓ | |

There are 25 clusters in Uttarakhand with the exception of Uttarkashi, Tehri, Champawat, and Bageshwar. Of these clusters, 6-7 are privately funded. The clusters train farmers to cultivate these plants. The fuel required to process these plants can be obtained from the residue of lemon grass after the oil has been extracted from their leaves. The HRDI is planning to expand the number of clusters. In this cluster approach, they provide free seeds to farmers who are below the poverty line. The institute gets involved in promotional activities which include subsidies, free planting material, technology training, and other technical assistance. The HRDI gets benefits from the National Horticulture Board (NHB) and the National Medicinal Planting Board (NMPB). For large-scale cultivation, these boards provide 20 per cent subsidy along with a 20 per cent matching grant by the state government. Credits are also arranged through the State Bank of India (SBI) and other Indian banks.

There is huge commercial value in the oils and essences extracted from aromatic and medicinal plants. Aromatic plants like lemon grass, citronella, palmarosa, chamomilla, tulsi, geranium, naramotha, Japanese mint, khas, and genda are used extensively in the cosmetics industry. Table 17 presents the approximate rate at which different oil extracts are sold in the market.

**Table 17 : Market price for oil extracts of aromatic plants**

| Name of plant | Rate for oil (per kg) |
|---|---|
| Lemon grass | Rs. 345 |
| Geranium | Rs. 3200 |
| Rose | Rs 2 lakhs and rose water Rs. 30 per liter |
| Tulsi | Rs. 250 |
| Stevia | Rs. 100 |
| Chamomilla | Rs. 12000 |
| Patcholi | Rs. 2500 |
| Palmarosa | Rs. 500 |

The main problems are the high cost of processing and the difficulty of getting buyers to the processing units. Oil extracted from plants is not linked with the pharmaceutical industry because of low production. Since limited quantities of aromatic and medicinal plants are produced, buyers are not able to establish linkages. There is scope for medicinal plants and medicinal trees like tejpatta, amla, harad, and bhagera are being planted. There is high demand for ritha but the forest department has not

taken any initiatives. For medicinal plants, support prices by the government are required because of long-term plantation. To increase production and productivity it is important to establish the cluster approach and low-cost processing. Forest cooperation has made 3-4 mandis where auctions take place. No government initiative has been taken in the case of aromatic plants.

There is a great deal of potential for the development of these crops in the hill regions without much heavy investment. The HRDI has tried to install processing units among the clusters of farmers close to their farms. When the area under aromatic plant cultivation exceeds 2 hectares, a disseleration unit with a capacity of 2 quintals is set up; when the area is 5 hectares, the disseleration unit has a capacity of 5 quintals and costs about 6 lakhs. The institute also has storage facilities where farmers can store their oil extracts if they are not sold at an appropriate price in the market. There is a need to take appropriate measures for improving productivity and production of herbal and medicinal plants and their trade in the state. Although the extension activities of the KVKs perform better in Uttarakhand, they still need to reach the hill regions in a more efficient way. Medicinal and aromatic plants can be a strong option for diversification but linkages with the market should be developed.

### 2.4 Organic farming

Yield levels can be effectively raised in a stable and sustainable manner only by adopting organic farming methods, since extensive use of chemical fertilizers ultimately leads to soil deterioration. As per statistics, the use of fertilizers in the hill districts is very low (Table 18). In Uttarakhand around 10,000 ha land is under organic farming, covering over 15,000 farmers and 45 crops. The key objective of diversifying towards organic farming is to improve crop productivity, soil health and the price of the output, and thus the income of the farmers. Organic products have a parallel market which, if captured in a strategic manner, can lead to the rapid development of these hill districts.

**Table 18 : Fertilizer use in Uttarakhand districts, 2005-06**

| District | Fertilizer consumption | Nitrogen | Phosphorus | Potash |
|---|---|---|---|---|
| Almora | 360 | 256 | 88 | 16 |
| Bageshwar | 264 | 201 | 54 | 9 |
| Chamoli | 219 | 123 | 91 | 5 |
| Champawat | 231 | 137 | 80 | 14 |
| Pauri Garhwal | 322 | 256 | 65 | 1 |
| Pithoragarh | 316 | 186 | 111 | 19 |
| Rudraprayag | 65 | 44 | 21 | 0 |
| Tehri Garhwal | 248 | 149 | 92 | 7 |
| Uttarkashi | 666 | 268 | 388 | 10 |
| Dehradun | 3898 | 2920 | 842 | 136 |
| Hardwar | 31851 | 23754 | 6740 | 1357 |
| Nainital | 8414 | 6050 | 1894 | 470 |
| US Nagar | 73768 | 53942 | 13208 | 6618 |

The hill regions are disconnected from the plains due to a poor road network and, thus, fertilizer is limited and expensive. This has increased the number of organic activities and farmers growing organic produce. Uttarakhand is the first state of the country to be declared an organic state. Due to this, a great need was felt to constitute an organization to promote and coordinate dispersed organic activities and efforts for organic farming in the state. The Uttarakhand Organic Commodity Board (UOCB) came into existence[16]. The role of the Board is to promote organic farming in the state and to provide options in diversifying towards organic farming. One achievement of the UOCB is that 42 commodities have been identified as market-potential produce and information about market demand has been passed on to producer groups through nodal agencies in Kumaon and Garhwal. The UOCB has an export market for basmati rice and spices, such as chillies, coriander, and amaranth. There is also a demand for millet and kidney beans. Training in organic food processing and value addition have been imparted to the producer groups, but lack of infrastructural facilities is a major constraint. It is necessary to integrate the farmers to generate surplus for exports, but the physical geography of the hill villages makes this difficult.

Another issue that emerges in marketing and making agriculture a commercial venture is **branding** the products so that they can be sold globally. The same product when produced by different farmer groups under different brand names usually does not reach the international market. It is important to market these products under a major brand name. It is crucial for the benefits to directly reach the producer. Value addition and product development are also important mandates of the UOCB. New innovative ideas need to go into this objective to make the organic produce of the hill districts compete with other products available in the market.

The UOCB has conducted an impact assessment of the farmers engaged in organic farming to understand how small measures of interventions can help aggregate quantitative changes in the life of the community. The findings of this study (UOCB, 2007) show that in the hilly regions organic farming can reduce the costs of producing the major crops--mandua and lentils--by 16.6 per cent and 10 per cent, respectively; in fact, average production per hectare of these two crops has increased by 45 per cent and 9 per cent, respectively. The market price of almost all organic products is higher than the price of conventional farming products. The market price for organically grown mandua is at least 150 times more than for the non-organic product. There is also a positive impact on soil fertility that, in turn, impacts the quality and yield of the produce. The program has increased farmers' skills and knowledge about organic farming, composting methods and value-addition techniques. Organic farming interventions have also led to a decrease in health ailments that has had a positive impact on the environment. In terms of employment generation there has been a mixed response from the farmers. At least 51 per cent agree that employment opportunities have increased due to organic farming intervention; at the same time, a large percentage of farmers feel that this new agricultural technology is unable to

[16] On 19 May 2003, the UOCB was registered under the Societies Registration Act, 1860 and acts as the nodal agency of the state to enhance organic activities in agriculture and allied sectors like horticulture, medicinal aromatic plants & herbs, and animal husbandry throughout the state. The board works with the mission statement "To Make Uttarakhand the Organic Capital of India" and the Vision Statement "To Achieve Sustainable Rural Development in the State of Uttarakhand through Organic Farming".

create a significant number of new employment opportunities. The report[17] concluded that setting up three institutions in marketing, credit and watershed management would considerably enhance the move towards organic farming in the state.

***Case Study: Organic Farming***

*The main program of the centre of organic farming (COF) is the development of products and market linkages. In the past two years COF along with the Uttarakhand Organic Board (UOCB) has taken steps to develop market linkages in the domestic and international market. In the hill regions the development of backward and forward linkages has always been a major challenge for the supply management model. In this unique model around 500 bio-villages are directly linked with one another so that there is scope for exponential expansion of the linkages without actually increasing the number of members in the chain. In the past two years, the model has been tested for different terminal markets as well as for specific food fairs The major supply chain members are the producer groups, trainers, service providers, wholesalers and retailers. Facilitation of retail sales of organic commodities packaged by producer groups through "Saras" marketing centers in Dehradun, Haldwani and other districts is constantly being encouraged. The UOCB has also facilitated the retailing of its organic commodities from producer groups through private outlets like "SARV, Handicraft Emporium" in Dehradun and outlets in other cities. More organic producer groups / federations are being directly linked with the retail outlets for the supply of value-added products. Marketing of organic vegetables from three clusters of bio-villages in the Ramgarh belt, Bhagwanpur, Doiwala and Chamba have been initiated. Most of these villages have been successfully linked to the markets and have provided reasonable premiums to the farmers. Vegetables are being marketed to the two Maharishi Ashrams in Uttarkashi on a monthly basis. The Ramgarh belts have connected with Heritage Foods, Delhi for a range of continental and off-season vegetables. Plans to facilitate the sale of organic vegetables grown by organic producer groups in Dehradun and other cities through the existing "Saras" marketing center in Dehradun, Nainital and other districts are in the offing.*

*For the domestic market, COF made generic agreements with 26 marketing agencies engaged in the marketing and sales of organic produce within the country. These agencies are registered with the COF marketing cell and then introduced to the farmer groups. The number of agencies interested in marketing organic produce in the domestic market is increasing at a very rapid rate. A regular market for the sale of organic produce is linked with the 35 outlets of 'Kendriya Bhandar' in Delhi.*

## 2.5 Animal Husbandry

The state of Uttarakhand encompasses a livestock population of 4,943,000, which accounts for 1.02 per cent of India's figure. Although this figure is quite small, dairy and poultry farming are essential alternatives to traditional farming in the hill regions of Uttarakhand. It can be seen from Table 19 that the infrastructure for livestock is minimal and even scarce in some districts. Among the districts, Pauri Garhwal district has the highest number of livestock, because of the high number of desi cows. In the case of poultry also, the same district has predominance over other districts, followed by Almora, Champawat and Pithoragarh. Almora and Pithoragarh come after Pauri

[17] An impact assessment study (UOCB, 2007) done for the UOCB covering small sample of 100

Garhwal in the case of total livestock; these two districts also have the highest number of goats. Although Pauri has the highest number of livestock, the percentage of pasture and grazing land (5.2%) is small compared to Almora (6.5%) and Pithoragarh (13.0%) (Table 20). This problem can be overcome by using part of the forest area for grazing.

Horses and mules are the backbone of the rural transport system in Uttarakhand and during 2003-04 the maximum number was registered in Uttarkashi, followed by. Garhwal (Pauri and Tehri) and Chamoli. Increasing road connectivity may be responsible for reducing the population of horses and mules in future. Champawat has the lowest number of sheep (both desi and cross-breed) with a great difference from other districts, while Uttarkashi has registered the maximum number of sheep. Sheep-rearing for wool can be a good opportunity for alternative liveihood. Yak, which are used for tourism, have a presence only in Pithoragarh and Uttarkashi and a marginal presence in Chamoli. Buffaloes are the main milch animals, contributing 62 per cent in milk production (State Focus Paper 2006-07, NABARD).

## 2.6 Forests

Forests play an important role in the economy of the state. Timber and fuel form the major produce group, while bamboo, drugs, grasses, gum and resins etc., the minor produce group. Forests are the major source of raw materials for industries, buildings, railways and other tertiary sectors. 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[18]. 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. HIMCON, a voluntary organization, is working on the issues. Agro-forestry can play an immensely important role in the rural economy. The wasteland can be converted to grow plants, fodder and fuel.

As shown in Table 20 all the hill districts have more than 60 per cent 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, inputs, etc can be adopted by organizations and clusters and diverted towards high-value cultivation. The maximum pasture and grazing land is in Bageshwar, Champawat and Pithoragarh; this is crucial for better fodder availability for livestock in these districts. Champawat also has large tracts of fallow land due to poverty, lack of water and the un-remunerative nature of farming.

[18] Malhotra (2005).

**Table 19 : Livestock statistics in hill districts of Uttarakhand, 2004**

| Livestock | Almora | Bageshwar | Chamoli | Champawat | Pauri Garhwal | Pithoragarh | Rudraprayag | Tehri Garhwal | Uttarkashi |
|---|---|---|---|---|---|---|---|---|---|
| Veterinary hospitals | 34 | 10 | | | | | | | |
| Livestock centres | 64 | 17 | 46 | 18 | 82 | 51 | 25 | 67 | 31 |
| Cattle | 237743 | 121121 | 188455 | 99637 | 357553 | 240748 | 102428 | 123160 | 106827 |
| Desi cows (total, incl. calves) | 108936 | 58340 | 89948 | 47061 | 225141 | 136677 | 53192 | 51222 | 45173 |
| Cross-breed cows (total, incl. calves) | 7404 | 1103 | 5309 | 9118 | 7738 | 14623 | 1330 | 1077 | 8117 |
| Desi bulls (total, incl. calves) | 118933 | 61442 | 83140 | 40165 | 123056 | 86772 | 46974 | 69659 | 50535 |
| Cross-breed bulls (total, incl. calves) | 2470 | 236 | 10058 | 3293 | 1618 | 2676 | 932 | 1202 | 3002 |
| Buffaloes | 109728 | 42250 | 55153 | 37621 | 66372 | 86877 | 37222 | 115050 | 38690 |
| Yak | 0 | 0 | 5 | 0 | 0 | 242 | 0 | 0 | 104 |
| Sheep | 4890 | 19983 | 45651 | 58 | 33963 | 32804 | 15636 | 14811 | 101268 |
| Goats | 171732 | 81105 | 78162 | 48492 | 150575 | 145173 | 39726 | 101981 | 95593 |
| Horses & mules | 1545 | 1710 | 5008 | 1194 | 3713 | 2140 | 1673 | 5014 | 6144 |
| Donkeys | 17 | 17 | 7 | 0 | 243 | 4 | 8 | 50 | 59 |
| Pigs | 771 | 72 | 374 | 605 | 980 | 151 | 130 | 480 | 2646 |
| Total livestock | 526426 | 266258 | 372815 | 187607 | 613399 | 508139 | 196823 | 360546 | 351331 |
| Total poultry | 62579 | 14737 | 18864 | 56658 | 68611 | 50506 | 5606 | 29393 | 39429 |
| Hens/ cocks/ chicks | 62567 | 14724 | 18864 | 56324 | 68557 | 50478 | 5606 | 29393 | 39429 |
| Other birds | 12 | 13 | 0 | 334 | 54 | 28 | 0 | 0 | 0 |
| Other animals (dogs & rabbits) | 19722 | 9529 | 15342 | 10028 | 20724 | 17438 | 5265 | 6982 | 37751 |

**Table 20 : Land use in hill districts of Uttarakhand, 2004-05**

*(Unit: in per cent)*

| Hill districts | Forest area | Culturable waste | Barren & unculturable land | Fallow | Pasture & grazing land | Misc., tree crops and groves | Net area sown (area under agriculture) | Land put to non-agricultural uses | Fallow + cultivable waste |
|---|---|---|---|---|---|---|---|---|---|
| Almora | 50.7 | 9.1 | 5.5 | 1.9 | 6.5 | 5.8 | 17.7 | 2.7 | 11.0 |
| Bageshwar | 51.6 | 7.9 | 3.2 | 2.4 | 12.9 | 9.7 | 10.2 | 2.2 | 10.3 |
| Chamoli | 59.7 | 5.7 | 18.7 | 0.2 | 5.9 | 4.8 | 4.1 | 0.9 | 5.9 |
| Champawat | 55.5 | 6.4 | 2.3 | 4.1 | 8.0 | 11.1 | 10.7 | 2.0 | 10.4 |
| Pauri | 57.2 | 5.7 | 5.3 | 3.9 | 5.2 | 8.3 | 12.0 | 2.3 | 9.6 |
| Pithoragarh | 50.0 | 9.9 | 5.1 | 1.4 | 13.0 | 6.5 | 11.7 | 2.5 | 11.3 |
| Rudraprayag | 76.4 | 3.4 | 3.1 | 0.6 | 1.8 | 4.9 | 8.5 | 1.3 | 4.0 |
| Tehri | 66.3 | 16.1 | 1.1 | 2.6 | 0.1 | 0.0 | 12.6 | 1.1 | 18.7 |
| Uttarkashi | 88.8 | 0.3 | 4.6 | 0.7 | 1.0 | 0.5 | 3.4 | 0.6 | 1.0 |

The forest department of Uttarakhand has not been able to protect the forests and their bio-diversity on its own. These are managed with the help of the Van Panchayat (Appendix 4), sacred groves, traditional forest panchayats, privately-owned community managed forests, and even the reserve forests managed by people[19]. The active involvement of people in conserving and managing these forests can result in high biodiversity along with meeting people's bio-mass requirements.

### 2.7 District-wise constraints

In all the hill districts farming and crop husbandry are the main economic activities. These districts also engage in dairy and poultry farming to diversify their source of earnings. The expansion of agriculture is limited due to limited irrigation facilities. Overall low productivity, shortage of inputs and lack of marketing have confined production to self-consumption. Agriculture technology mission schemes have been launched in these districts to increase productivity, but their impact has not reached the farms. In terms of marketing besides the development of local, well-integrated mandis, the amended APMC act needs to be implemented.

**Almora** is basically active in crop husbandry and dairy development. On the marketing front a *Saras* marketing facility has been set up, which has tried to solve problems related to marketing facilities. There are 70 storage go-downs in the district, but they are in poor condition and are mainly used by government agencies. This is true of other districts also. Although the district has a large population that is dependent on dairy farming, the district does not have a milk route. For animal husbandry also breed-improvement technology and programs are not available in the district. There is an acute shortage of hatcheries too.

**Bageshwar** is known for its beauty. The Gomati and Saryu are the main rivers flowing through this district. This district is characterized by small villages scattered at varied heights. The district consists of ridges and valleys that make agriculture difficult. Hence, large portions of the district remain forested. The district is rich in timber and forest plants. Dairy is the main activity in this district. On the infrastructure side, it has a milk-chilling plant that can handle a capacity of 2,000 litres per day. Although there are 75 milk societies in the districts, two of the four milk routes have closed down because they were uneconomical. These milk routes need to be re-opened as commercial ventures and rural haats should be developed. Due to the suitable climate, poultry is very successful especially in meeting the needs of the plains; again, the main hurdle is the lack of infrastructure but this sector can be commercially developed.. The women of the district are engaged in rural handicrafts but there is lack of skill upgrading, innovation and market linkages for this activity. There is no animal mandi in the district and the closest are in Pantnagar and Kashipur. On the extension side there is a shortage of staff and technical support, green fodder, vaccination, breeding facilities, insurance, etc. There is also a problem of limited grazing land to rear sheep and goats.

In **Chamoli**, the Alakananda is the largest river. The area under assured irrigation is almost negligible but there is potential to bring areas under irrigation through lift irrigation and rainwater harvesting. Currently, the only source of water for irrigation is surface water and there is limited scope for exploiting ground water. For irrigation,

[19] Dewan and Singh (2005)

new hydrams need to be built and the old ones better maintained. Dairy and poultry farming are also important in the district. There are nine milk routes in the district but only two are operational. The district milk federation is trying to operate an additional milk route. There is no hatchery unit for poultry. The district also lacks a regulated mandi and the lack of veterinary institutes, fodder, water, and vaccine are further constraints. Chamoli has 2,000 gharats--water mills with wooden runners-- where the power output is 0.25 kva but these are running at only 20 per cent efficiency. The major food crops are buckwheat, paddy, maize, mandua, potato, vegetables, rajma and ramdana.

**Champawat** is the most backward hill district of Uttarakhand and has the maximum amount of hill terrain. Only 8 per cent of the net cultivated area is irrigated. As in other districts, agriculture is the main economic activity but the district has diversified into cultivating fruits and vegetables. Since few chemicals and fertilizers are used, the organically-grown produce commands a higher price. However, the district lacks inputs, infrastructure and technical know-how. The land holdings are small and scattered and there is no assured market for commercial production. Due to poor soil health and soil erosion caused by heavy rainfall and landslides, productivity is affected. There are 21 seed stores and fertilizer depots with a capacity of 490 tonnes, and 15 go-downs and four plant protection depots. KVK and soil testing are available at Lohaghat. However, irrigation facilities need to be developed although around 100 ha area was brought under irrigation last year and about 500 ha area last year was brought under HYV seeds. There is a need to develop Krishak haats and mandis at Tanakpur, which will help solve problems linked to shortage of seed supply. The district is rich in high-value medicinal plantations but cultivable land is limited. It has a suitable climate for tea plantation, sericulture and floriculture, but storage facilities are a problem. For dairy development there is a shortage of green fodder and feed due to which milk yield is low.

**Pauri Garhwal** is the largest hill district of the state. Small villages are scattered at different heights. Due to heavy rainfall, there is a lot of soil erosion. This district faces serious problems in terms of seed quality and lack of credit, drinking water, power supply, and milch animals; there are few milk routes and there has been reckless deforestation. The irrigated area is only 8.5 percent of the net cropped area. Farming is the main activity and organic cosmetic ingredients are produced. 105 villages have been declared organic villages. Thus there is a need for bio-fertilizers and bio-pesticides.

Since **Pithoragarh** district is on the border with Nepal and China; international trade can be developed with minimum transportation costs. Huge water resources in the districts have attracted hydropower projects. The main farming activities are organic horticulture, off-season vegetables, and medicinal plants along with wool-based products and dairy farming. Farmers have changed the cropping pattern and opted for commercial farming, but traditional farming needs to be preserved. However, the district is able to generate marketable surplus only for vegetables and spices. There is a need to support farming through infrastructure development; for example, at present there is only one soil testing laboratory, and there is a need for watershed programs and farm mechanization despite the small size and fragmented nature of the farm holdings. An integrated cereal, pulse and oilseed development program is being implemented. This district has been identified under AEZ for medicinal plants, such as atish, kutki, jatyamansi, chiraita, tagar, and kuth. There are only 122 registered

growers for medicinal plants. The district has a suitable climate for tea plantation but lacks processing and post-harvest storage facilities. The district has a shortage of milk and poultry. The major food crops are paddy, wheat, madua, oats, finger millet (koda), and buckwheat. For commercial purposes, potatoes, rajma, garlic, ginger, mustard, pulses and soybean are grown. The major plantation crops are sisal, bamboo/ ringal, and chura, while horticulture crops are apples, apricots, pears, peaches, plums, citrus fruits, walnuts, litchi, and mangoes.

**Rudraprayag** was carved from Chamoli and Tehri. Its major crops are wheat, paddy, mandua, sava, barley, pulses, off-season vegetables and potatoes. The area under irrigation is negligible but irrigated areas can be created through rainwater harvesting. As in other districts, kisan credit card schemes are operational but due to small operational holdings the scope for farm mechanization is minimal. The climate of the district is suitable for fruits like malta, apples, pears, and walnuts besides aromatic plants and medicinal plants like lemon grass geranium, kutki, and stevia. Dairy development can be a viable activity, but there are constraints in the veterinary department, fodder, vaccination, etc. There is a need to develop poly-houses for off-season vegetables. Farmers are not aware of fertilizer use and also need to diversify crop production. There are two community-based training centers for fruit preservation and the development of medicinal and aromatic plants; Gopeshwar at Chamoli is the nodal point. For forest and wasteland development, central schemes have slowed down. There is a need for land development and vermin-composting. For dairy farming, there are only four milk collection centers and six milk routes. But the non- availability of quality milch animals due to the absence of an organized cattle market is a constraint as is a small chilling plant. Also there is need to develop poultry farming as an alternative livelihood.

In **Tehri Garhwal,** the Yamuna River forms the western border and the other rivers are the Bhagirathi, Bhilangana and Alaknanda. There is very low use of fertilizer in the district mainly because of the non-availability of essential agricultural inputs like quality seeds, fertilizers, plantation materials, veterinary services, poultry hatchery units, animal feed units, and power supply. The milk routes have not been developed. Due to the development of the Tehri Dam (Appendix 5), a lot of fertile land has been submerged in the catchment reservoir of the Tehri hydel development project. Although farming is the main activity, there is little cultivation and farming is only at subsistence levels. The major crops are coarse millets like jhangora and mandua, unirrigated crops like dry paddy, mandua, barley, and jhangora, and produce like apples, potatoes, green peas, cabbage, and cauliflower, good quality spices like ginger chilly, and turmeric, and off-season peas, cabbage, french beans, potatoes, tomatoes, etc.

**Uttarkashi** has the maximum livestock. The net sown area is only 3.3 per cent and land holdings are fragmented. There is a lack of HYV, organic manure, and bio-pesticides. Vegetable cultivation is done in the Ganga and Yamuna valleys where irrigation is available either through ghuls or hill channels. Although KVK is operational in this district, there is a need to educate farmers on adequate technology and mechanization. This district has been covered under AEZ for medicinal and aromatic plants. But there is a need for timely supply of seeds/ plantation material, improved marketing, cold storage and transportation facilities. The major food crops are paddy, wheat, maize, manduwa, sava (coarse millet), rajma, urad, garath, soybean, mustard, and til. The vegetables grown are potatoes, tomatoes, radish, cabbage,

cauliflower, brinjals, french beans, and cucumbers; the fruits are apples, peaches, walnuts, apricots, citrus fruits, pears, and plums. Medicinal herbs include kuth, kuttki, sarpgandha, jatamasi, chiraita, and tagar.. Milk availability in the district is low and the milk societies require capital to develop infrastructure and markets. There is also no fodder depot. Cattle bought from outside are less adaptable to the cold weather of Uttarkashi and thus cross-breeding is needed within the district, but vaccine is a constraint. Since Uttarkashi is rich in livestock, wool-rearing is a viable option. There is a wool-marketing centre near Rishikesh, but for the past few years it is unable to procure wool and farmers are not able to sell their products.

## 2.8 Development of Markets

The status of agricultural market development in the different hill districts of Uttarakhand does not present a very good picture. Almora has a strong market linkage that is even better than the state average. However, the agricultural markets in Pauri and Tehri districts are very weak, while Bageshwar, Chamoli, Champawat, Pithoragarh, Rudraprayag and Uttarkashi do not have any organized agricultural market setup in the region[20].

If alternative agriculture and agriculture-based activities are to be developed in the hill districts, the most crucial factor is to link the producers with the markets. Markets for vegetables and coarse cereals should be developed as they have very good potential in almost all the hill districts. Herbal hubs and aromatic plantation in the hills can be developed using the cluster approach and contract farming. These plants should be grown organically. People should be trained and get employment in sorting and packing activities. Besides setting up market infrastructure, non-profit agencies are also needed for an intermediary role between the backward and forward links. A brand name needs to be created for each product before it is sold; this will help producers get good returns. Some examples are bhatt (native soya) which is a very nutritious and high-value crop; there are many other such crops--amaranth, jhangara (millet) and ragi—that are in huge demand by the health-conscious urban population. Correct estimates of market requirements along with its strategic implementation can link producers to these consumers and create better incomes. The government is creating small-scale local processing units and cooperatives of communities, thereby reducing the role of middlemen. Navdanya has created a group of women who are involved in processing and has trained them.

***Case Study – Navdanya***

*The development of the hills has to be linked with the unique features of its climate and biodiversity and the limitations of large-scale industrialization. There has to be a different approach to the development of infrastructure in the hills. Women are the main capital for the development of Uttarakhand. They work very hard and go to the forests to get fuel, etc. Navdanya has tapped the ecology, biodiversity, and women's participation in the hills and managed to double farmers' income. It has 3,000 farmer members across India. They have set up research conservation training farms where organic farming, which is low-cost and chemical-free, is being propagated. A participatory agency provides seeds, which Navdanya further distributes to farmers who are members. Navdanya has set up women's groups and trained them in food processing. To increase profits, more value-added services have been created and low-cost production techniques adopted. They propagate agriculture, wool- rearing, agro- processing, etc as an alternative source of income for hill people.*

[20] *Potential Linked Credit Plan, 2007-2008.*

On the input side, informed market linkages also need to be developed. The quality and price at which the seeds, fertilizers and pesticides are made available can be improved if proper information, awareness and linkages are made available. This will add to the income of the hill farmers as they can reduce the cost of production and also get better yields. Decentralization is also required; the government needs to play a participatory role with the communities to devise special markets for specific regions. Markets for unique biodiversity products should be developed in the hills.

Terminal markets have been created by the government to strengthen market linkages. These markets aim to enhance the participation of private sector players by providing state-of-the-art market infrastructure for perishable food products. The modern Terminal Market in Chandigarh is the first terminal market to be set up in India. Chandigarh emerged as a natural choice for setting up the terminal market as it serves as a market for fruits, vegetables, flowers and other perishable products for the adjoining villages of Punjab, Haryana, Himachal Pradesh, Uttarakhand and western Uttar Pradesh. The well-developed physical infrastructure, road and electronic connectivity, and availability of adequate power and water resources have made Chandigarh a focal point for catering to the needs of farmers as well as consumers. The market is not yet fully functioning. It caters to the needs of districts in the plains of Uttarakhand, but it is not accessible to people in the hill regions. In such a situation, it is important to either create low-cost collection centers and facilities linking the hill region to the terminal market in Chandigarh or alternatively such terminal markets (that may be smaller in size) can be created in one of the common identified regions of Uttarakhand. However, the surplus generated for the hills might not be large enough to make it economically viable to transport the products to Chandigarh, nor would it be possible for hill farmers to acquire such assets. Another upcoming feature is the development of mandis through private investment. Reliance and ITC are planning to set up agri-businesses in a major way in Uttarakhand with the state government offering bulk licenses to set up private mandis that provide a better deal to farmers. This might help farmers get better prices at the farm gate.

Other measures taken by the state government are the creation of Basmati Export Zones, and the decision to set up medicinal and agro-food export zones and create its own dry port facilities in the plains at Dehradun and Pant Nagar. This will help link the hill districts with districts in the plains and also add to the development of hill people. The state has potential to export certain products but the constraint is low investment in infrastructure and need to create a low cost-sustainable supply chain.

## 3. Development of SMEs

### 3.1 Industrial Policy

Uttarakhand has seen strong industrialization during the past five years, but that was mainly in the plains, following the special package announced by the Centre in 2003. Thus an Integrated Industrial Development Policy 2008 was launched in February especially for the industrial development of hilly and remote areas in the state. This policy has aimed at the economic development of the hill region. With the objective of inclusive growth, the main concentration is now on the hill districts. This policy aims to accelerate industrial development in the industrially backward and remote hill districts of the state, to develop industrial infrastructure, and to encourage

entrepreneurial development through market encouragement and financial support to entrepreneurs. The creation of employment opportunities along with the removal of economic backwardness is expected to help control the migration of the population towards the plains and other states in search of better livelihoods. This policy targets industries in the manufacturing and services sectors. These steps are in addition to the Industrial Policy, 2003, which aimed to provide a comprehensive framework to enable a facilitative, investor-friendly environment to ensure rapid and sustainable industrial development in Uttarakhand and, through this, to generate additional employment opportunities and to bring about a significant increase in the State Domestic Product and eventual widening of the resource base of the state.

The policy looks at providing single-window facilitation in the state to expedite project clearances and to provide an investor-friendly climate. It also looks to provide and facilitate expeditious land availability for setting up industrial ventures and infrastructure projects. The policy aims to provide assured, good quality, uninterrupted and affordable power for industries and to simplify and rationalize labour laws and procedures in line with current requirements while ensuring that workers get their due share in the economic prosperity of the state. For small-scale industries, cottage, khadi and village industries, handicrafts, and the silk and handloom sectors, it will assist them in modernization and technological upgrading and provide necessary common facilities and backward and forward linkages, including product design and marketing support so as to make them globally competitive and remunerative.

The State Infrastructure & Industrial Development Corporation of Uttarakhand Limited[21] (SIDCUL), a government of Uttarakhand enterprise, was incorporated as a limited company in the year 2002 to promote industrial development in the state. It provides financial assistance to promote industries and develop industrial infrastructure in the state of Uttarakhand directly or through Special Purpose Vehicles, Joint Ventures, assisted companies, etc. Most of its major industrial infrastructure has been developed in the plains with limited concentration in the hills. Some of its major projects include the Integrated Industrial Estate at BHEL in Haridwar, the Integrated Industrial Estate at Pantnagar, an IT Park in Dehradun, Pharma City in Selaqui, Dehradun, the Growth Centre at Pauri, and the Integrated Industrial Estate at Sitarganj. SIDCUL enables industrial projects to be set up in a short time. The Corporation administers all promotional schemes of the government for industries and uses the single-window system.

### 3.2 Industrial profile of Uttarakhand

Against this background, this section of the paper examines the status of industrialization and employment in the state of Uttarakhand and hill districts of the state. Table 21 presents the overall comparison of the state of industrialization in Uttarakhand and India. There has been an impressive increase of 18 per cent in SSI units in India from 2001-02 to 2006-07 and in Uttarakhand this increase is 22.8 per cent. Of these SSIs registered units showed an increase of about 50 per cent and unregistered of about 15 per cent in Uttarakhand, whereas the figures for India are 32 per cent and 15 per cent, respectively. This increase in scale of SSIs in Uttarakhand

[21] http://www.sidcul.com/sidculweb/home.aspx

can be attributed to the industrial policy of 2003. Thus, after the industrial policy of 2008 is implemented, the industrialization process is expected to strengthen even in the hill regions.

**Table 21 : Number of small-scale industrial units in India and Uttarakhand (2001-02 and 2006-07)**

| Type of Industry | Uttarakhand | | India | |
|---|---|---|---|---|
| | 2001-02 | 2006-07 | 2001-02 | 2006-07 |
| Small-scale Industry units | 106484 | 137618 | 10521190 | 12843774 |
| Registered | 15285 | 30268 | 1374974 | 2031910 |
| Un-registered | 91199 | 107350 | 9146216 | 10811864 |

*Source: Indiastat (www.indiastat.com). Outsourced from Annual Report 2001-02, 2003-04 Ministry of SSI, Govt. of India and various Annual Surveys of India.*

**Table 22 : Factories (registered under Factories Act 2M I and 2M II Act, 1948)**

*(Units: Value Rs. in Lakhs & Others in Number)*

| | Uttara-khand | India | Uttara-khand | India | Uttara-khand | India |
|---|---|---|---|---|---|---|
| | 2001-02 | | 2004-05 | | Per cent increase | |
| No. of factories | 698 | 128549 | 752 | 136353 | 7.18 | 5.72 |
| No of workers | 27317 | 5857848 | 35349 | 6599298 | 22.72 | 11.24 |
| Total persons engaged | 40880 | 7750366 | 51762 | 8453624 | 21.02 | 8.32 |
| Net Value Added | 82468 | 14430212 | 194801 | 25990686 | 57.67 | 44.48 |
| Gross fixed capital formation | 22028 | 7015145 | 77726 | 7458995 | 71.66 | 5.95 |
| Profits | 2439 | 3488385 | 105677 | 14460199 | 97.69 | 75.88 |

*Source: Indiastat (www.indiastat.com) Outsourced from Annual Report 2001-02, 2003-04 Ministry of SSI, Govt. of India and Various Annual Surveys of India.*

Similarly, Table 22 shows that the relative improvement in industrialisation in Uttarakhand has been much better than in the country over the period 2001-04. In Uttarakhand over the periods 2001-02 and 2004-05 the number of factories increased by 7.2 per cent with an increase in workers of about 23 per cent. Gross fixed capital formation increased by 72 per cent and profits by 98 per cent. This shows a very positive impact on the employment status in the state as a result of industrialisation.

Table 23 shows the status of industrialisation in the districts of Uttarakhand. Table 24 shows these numbers as a percentage of the total for Uttarakhand. It is clear from the table that industrialisation took place in the plains of Uttarakhand much before it did in the hill regions. Dehradun, Haridwar, Nainital and Udham Singh Nagar have about 89 per cent of the factories set up in Uttarakhand. Also of all the workers engaged in Uttarakhand, 94 per cent are employed in the plains. Many of these workers have migrated from the hill districts or even from neighbouring states. Among the hill regions it is only Almora that has set up small-scale industries and Khadi/ Gram Udyogs. Almora has about 31.3 per cent of the state's small-scale industries, which is similar to that in Haridwar and also about 13.7 per cent of the Khadi and Gram Udyogs. The number of employees of khadi units and SSIs in Almora are about 9.8 per cent and 38.9 per cent, respectively. Pithoragarh has shown a relatively better setting up of Khadi and Gram Udyogs in relation to other hill districts. Bageshwar, Champawat, Rudraprayag and Uttrakhshi are the least industrialised hill districts, where even the setting up of Khadi and Gram Udyogs is almost negligible. It is expected that the new industrial policy will focus on these districts.

**Table 23 : Status of industrialisation in districts of Uttarakhand, 2004**

| District | Khadi/ Gram Udyog units | Small-Scale Industries (SSIs) | Total employees of khadi units | Total employees of SSIs Factories act | No. of factories | No. of workers |
|---|---|---|---|---|---|---|
| Almora | 1608 | 3463 | 2154 | 14906 | 9 | 486 |
| Bageshwar | 47 | 614 | 104 | 823 | 5 | 375 |
| Chamoli | 1299 | 185 | 1305 | 364 | | |
| Champawat | 190 | 422 | 400 | 985 | 7 | 33 |
| Pauri Garhwal | 1523 | 542 | 1759 | 1175 | 49 | 3189 |
| Pithoragarh | 1689 | 1106 | 2637 | 1660 | 2 | 94 |
| Rudraprayag | 72 | 289 | 143 | 627 | | |
| Tehri Garhwal | 1129 | 254 | 2162 | 613 | 34 | 780 |
| Uttarkashi | | 155 | | 231 | 1 | 160 |
| Dehradun | 2529 | 346 | 8651 | 1353 | 171 | 22156 |
| Hardwar | 1608 | 3463 | 2154 | 14906 | 127 | 14654 |
| Nainital | 18 | 152 | 80 | 486 | 118 | 8875 |
| US Nagar | 42 | 76 | 375 | 208 | 438 | 27490 |

**Table 24 : Per cent share in industrialisation of districts in Uttarakhand, 2004**

| District | Khadi/ Gram Udyog units | Small-Scale Industries (SSIs) | Total employees of khadi units | Total employees of SSIs Factories act | No. of factories | No. of workers |
|---|---|---|---|---|---|---|
| Almora | 13.7 | 31.3 | 9.8 | 38.9 | 0.9 | 0.6 |
| Bageshwar | 0.4 | 5.5 | 0.5 | 2.1 | 0.5 | 0.5 |
| Chamoli | 11.1 | 1.7 | 6.0 | 0.9 | | |
| Champawat | 1.6 | 3.8 | 1.8 | 2.6 | 0.7 | 0.0 |
| Pauri Garhwal | 13.0 | 4.9 | 8.0 | 3.1 | 5.1 | 4.1 |
| Pithoragarh | 14.4 | 10.0 | 12.0 | 4.3 | 0.2 | 0.1 |
| Rudraprayag | 0.6 | 2.6 | 0.7 | 1.6 | | |
| Tehri Garhwal | 9.6 | 2.3 | 9.9 | 1.6 | 3.5 | 1.0 |
| Uttarkashi | | 1.4 | | 0.6 | 0.1 | 0.2 |
| Dehradun | 21.5 | 3.1 | 39.5 | 3.5 | 17.8 | 28.3 |
| Hardwar | 13.7 | 31.3 | 9.8 | 38.9 | 13.2 | 18.7 |
| Nainital | 0.2 | 1.4 | 0.4 | 1.3 | 12.3 | 11.3 |
| US Nagar | 0.4 | 0.7 | 1.7 | 0.5 | 45.6 | 35.1 |

The public sector has remained the major source of employment in the organized sector for Uttarakhand as well as for India. It is evident from Table 25 that employment in the state public sector has registered a negative growth rate between the period 2001 to 2005. However, the state private sector has reported positive employment growth.

**Table 25 : Employment in Organized sector**

*(Unit: employment in '000)*

| Year | Uttarakhand | | | India | | |
|---|---|---|---|---|---|---|
| | **Public** | **Private** | **Total** | **Public** | **Private** | **Total** |
| 2001-02 | 228.4 | 36.9 | 265.3 | 18773.4 | 8432.1 | 27205.5 |
| 2002-03 | 214.6 | 32.3 | 246.9 | 18449 | 8534.2 | 26983.2 |
| 2003-04 | 220.8 | 36.8 | 257.6 | 18196.7 | 8246 | 26442.7 |
| 2004-05 | 224.0 | 37.3 | 261.3 | 18006.6 | 8451.1 | 26457.7 |
| **Rate of growth** | **-0.3** | **1.64** | **-0.03** | **-1.38** | **-0.28** | **-1.03** |

*Source: Indiastat (www.indiastat.com). Outsourced from Ministry of Labor and Employment.*

### 3.3 Small-Scale Industries and employment

Industrialization is an opportunity for people of the hill regions and it is not only production but also activities related to tourism and agriculture that can be given the status of industries. For successful industrialization, participation of women and in-house employment need to be given importance. For the development of the hill regions, creation of feasible employment opportunities is very important. Industrial activity in the hill regions can be tapped in local agro-based industries (e.g. herbs, fruits, frozen tulsi, fruit juices, and jams) and handicraft industries (e.g., shawls which are warmer than quilts). There is a need to provide the latest technology and easy accessibility to raw materials in order to improve the output. At the local level it is necessary to create cooperatives of small-scale industries, as well as good artisan cooperatives that will coordinate with an external marketing agency to sell the products. Some of these employment opportunities are presented in the form of the case studies of the Himalayan Environmental Studies and Conservation Organization (HESCO) and the Ajeevika program.

Most crucial for the development of any business is the development of entrepreneurial skills. Since in the hill regions men have migrated towards the plains and it is the women who are engaged in various activities, it is important to develop the entrepreneurial skills of women. There are a number of alternative economic activities that women can engage in but these petty businesses are unable to yield reasonable levels of income to the households. This is due to various constraints like raw materials and services in the case of dairy farming, lack of technical guidance and marketing in bee-keeping, and lack of awareness and marketing facilities in the case of mushroom cultivation. Households engaged in petty business mainly face credit problems. Here the role of micro-credit institutions becomes very important.

***Case Study: HESCO***

*HESCO is involved in many activities involving village women to make them self-sustained and add to the family income. They go to the places where there are agricultural activities and train people. They are financed by the project as well as by the WISE group (Women Initiation for Self Employment that has been proposed by NABARD. They sell their products under the brand name SUVAS (name by army people) and WISE (name by women). This activity can be taken up in a single room and does not require much investment. They have in-house trainers for this activity. They involve women in these activities irrespective of their qualifications. Various activities that are undertaken to create livelihood opportunities are fruit preservation (squashes, pickles) and rural bakery, in which they make biscuits from mandua, chaulie and millet. Brand names attached to these products are WISE. The activities and products include pulse processing, spice processing, bio-crafts and handicrafts, candle-making using wax from bee-hives, hand-made paper, envelopes, and greeting cards. With fibers from Ringal, products like bags, dolls, wall hanging, carpets, and furniture are created. They are also involved in making sweets from local crops, which are often sold at temples and other religious places as prasad. They sell HESCO ladoos as prasad and have an annual turnover of around Rs. 36 lakhs. Women and villagers are also given training to contain soil erosion, and use water mills for alternative activities like power generation and grinding rice and wheat. Making use of solar energy for electricity is also taught. Bio-mass activities, like using bio-mass to make charcoal through pyrolizer and using this coal in bakery units, are taught.*

***Case Study: Ajeevika***

*The Uttarakhand livelihood improvement project for the Himalayas, known as Ajeevika, is being implemented by the Uttaranchal Gramya Vikas Samiti (UGVS) run by Jyotsana Sitling. They work specifically for hill regions. To date they have helped 42,690 households in 17 blocks of 5 districts. For each household 6-7 baskets of options are available. The target group is poor people, the physically and mentally handicapped, and people with small landholdings who do not have any other assets. They play two roles: (a) Social win- Under this wing they interact with companies. Institutional, transactional and financial capacity building is done by the government. (b) Business wing- It is handled by venture capital companies and provides business development services. They have SMEs focusing on micro-level economic activities. They are also involved in business services and have various business models. They have an institutional framework with governments. If this project proves successful, it can be used for rural empowerment in other regions too. They use a business development model; through the sub-sector, the project will support the development of livelihoods that are based on micro-enterprise.*

In the case of small home-processed food products, marketing facilities pose a major bottleneck. The government should adopt successful models like "lizzat papad" to make some of these activities economically viable. The study by Sekhar, 2007 showed that development of entrepreneurship levels in women helps provide them with a level of income that is higher than poverty line income (Table 26). Although there is potential for income generation in the case of mushroom cultivation and bee-keeping, it remained untapped mainly because of constraints and indicates that certain corrective action should be taken (Table 27). A case study of Rural Litigation and Entitlement Kendra (RLEK) shows how creating awareness and training can also help in the development of entrepreneurial skills.

**Table 26 : Proportion of total household income by category of entrepreneurship**

*(Unit in per cent)*

| Activity | Farm income | Entrepreneurial income | Wage income |
|---|---|---|---|
| Dairy farming | 74 | 23 | 3 |
| Poultry farming | 40 | 58 | 3 |
| Papad-making | 0 | 86 | 14 |
| Mushroom cultivation | 100 | 0 | 0 |
| Bee-keeping | 80 | 20 | 0 |
| Quilt-making | 59 | 13 | 28 |
| Petty business | 19 | 70 | 12 |

*Source*: IEG Working paper, C.S.C. Sekhar.

**Table 27 : Summary of constraints and proposed corrective action**

| Activity | Problems/Constraints | Suggested Corrective Action |
|---|---|---|
| Dairy farming | Feed/fodder, animal health services | Provision of health-care facilities |
| Papad-making | Availability of finance, marketing facilities | Credit provision through rural banks, SHGs and thrift groups, collectivizing marketing through co-operatives |
| Mushroom cultivation | Technical guidance and marketing facilities | Provision of training and developing marketing |
| Bee-keeping | Technical guidance and marketing facilities | Provision of training and developing marketing |
| Quilt-making | Inadequate payment by contractors, health problems | Ensure timely and adequate payment, provision of health-care. |
| Petty business | Availability of finance | Credit provision through rural banks, development of SHGs and thrift groups |

*Source: Sekhar (2007).*

***Case Study: Rural Litigation and Entitlement Kendra (RLEK)***

*RLEK is involved in training women to participate in the Panchayat System. They have a legal literacy program where they make women aware of their rights. In Bageshwar, RLEK runs a Jan Shiksha Sansthan for vocational sources and 18 schools in remote areas. For these 18 schools, RLEK works in partnership with villages that provide land to them. Foreign units also help them for the same. The Law Ministry and Labor Ministry are helpful for adult education. Another unit run by RELK is the State Resource Centre for Adult Education, which a technical support agency. The Ministry of Human Resource and Development has set up a State Resource Centre (SRC) in every state that is totally funded by the GOI. SRCs provide technical assistance which includes research, monitoring and evaluation, setting the curriculum, and material preparation. SRC also provides vocational training which covers the reproductive and productive age group of 15-35 years. It includes training in mobile repair. In Champawat, there is one model centre where illiterates make envelopes from scrap and earn Rs. 50 per day. Embroidery, Jardogi, and making chalk are other options.*

*RLEK runs the Panchayati Rule Gender Awareness Training Institution (PRGATI). The main focus of these programs is women's empowerment. Women participate actively. They escort women to blocks to develop their leadership qualities and once they win, they train them in their development. They have 281 self-help groups (SHGs) in the whole of Uttarakhand, e.g., in Chakrata block, Uttarkashi and in Tehri. Since agriculture is the main activity for women in the hills and men migrate for better jobs, women need to be more empowered and aware of the proper utilization of money. RLEK helps them develop their skills. Women face many problems, e.g., they have to pay high interest on borrowed money and many times their money is blocked when they invest. They do not have information about different schemes operating in banks. It has been suggested that there should be some centers which pass on this information to them. They organize open forums, conferences, seminars and workshops to provide information on the gender perspective and make women more aware. Evidence shows that they are doing quite well despite being uneducated and the importance of being aware should be emphasized.*

## 4. Promoting Tourism

An Uttarakhand Tourism Development Master Plan for 2007-22 has been developed that is coordinated by the Government of India, Government of Uttarakhand, United Nations Development Programme (UNDP) and World Tourism Organization. The aim of this plan is to develop high-quality sustainable tourism infrastructure, facilities and products in the prime tourism zones of Uttarakhand state. The plan attempts to identify, define and describe these zones and their unique resources. It also proposes how such resources can be utilized to create different viable and sustainable nature- and culture-based products of various standards. The prevailing resources of the Garhwal and Kumaon regions need to be utilized along with trying to sort out the problems associated with the development of tourism in these regions.

There is wide and diversified demand for tourism in this state from both the domestic and international markets in terms of content and standard of facilities and utilities. The state attracts tourists for pilgrimages, cultural tourism, nature tourism, adventure tourism, wildlife tourism, eco-tourism, and amusement and leisure tourism. The approach to tourism development in Uttarakhand has to be based on the strengths of this state. Since Uttarakhand is rich in natural beauty with a unique mountain environment as well as rich historical and cultural assets, diverse products have to be designed for various categories of people who travel to this state for different motives. Along with the development of tourism, the present environment assets must be conserved and the areas where deterioration has taken place should be upgraded and improved.

The main problem in the development of the state is proper infrastructure to support sustainable tourism. Tourist zones have to be connected by formal and informal links in the form of roads, trails, tracks, and thematic circuits. The seasonality of different kinds of tourism and tourists to be attracted should be taken into account, so as to create employment for year-round tourism. The tourism plan needs to develop new tourist options that target different types of tourists as well as showcase the culture, handicrafts, and cuisine of that tourist option. Proper publicity and marketing are required along with the development of skills in tourism sub-sectors to provide world-class service. Training institutions that impart skills and partnerships with the public sector to develop the resources need to be integrated into this plan. Resources have to be mobilized for marketing and creating infrastructure. There are already some master plans by the government for both the Gharhwal and Kumaon regions (Appendix 6) that need to be implemented appropriately and in integration with upcoming government plans.

### 4.1 Status of Tourism Sector

Trends of tourist arrivals show that in Uttarakhand both foreign and domestic tourists have gradually increased. The per cent change in number of foreign tourists over the previous year was lower in Uttarakhand than in India until 2003-04, but after that the state witnessed growth in the number of foreign tourists (Table 28). However, overall tourist arrivals in Uttarakhand are much lower than arrivals in India. As shown in Table 29, of the total number of tourists who arrive in India only 3-4 per cent visit Uttarakhand. This situation has remained unchanged since the state was created in 2001. Among tourists, the majority are domestic tourists and the foreign tourist share

is less than 1 per cent. This portrays a gloomy picture of state tourism development and also shows that there is a lot of potential for developing this sector.

**Table 28 : Status of tourist arrivals**

*(Unit: Million)*

| Year | Tourist to Uttarakhand | | | Tourists to India | | |
|---|---|---|---|---|---|---|
| | Total | Domestic | Foreign | Total | Domestic | Foreign |
| 2001 | 9.60 | 9.55 | 0.04 | 241.91 | 236.47 | 5.44 |
| 2002 | 10.65 | 10.61 | 0.05 | 274.76 | 269.60 | 5.16 |
| 2003 | 10.89 | 10.84 | 0.06 | 315.75 | 309.04 | 6.71 |
| 2004 | 11.78 | 11.72 | 0.06 | 374.52 | 366.23 | 8.36 |
| 2005 | 14.29 | 14.22 | 0.08 | 392.08 | 390.47 | 9.94 |
| 2006 | 19.45 | 19.36 | 0.10 | 472.56 | 461.16 | 11.40 |

*Source: Central Statistical Organisation.*

**Table 29 : Share of tourists in Uttarakhand compared to India**

*(Unit: Percentage)*

| Year | Uttarakhand | Domestic Tourists | Foreign Tourists |
|---|---|---|---|
| 2001 | 3.97 | 4.04 | 0.82 |
| 2002 | 3.88 | 3.93 | 0.87 |
| 2003 | 3.45 | 3.51 | 0.82 |
| 2004 | 3.15 | 3.20 | 0.75 |
| 2005 | 3.65 | 3.64 | 0.76 |
| 2006 | 4.12 | 4.20 | 0.84 |

**Table 30 : Availability of tourism infrastructure, 2006**

| Infrastructure | Number | Availability of infrastructure (per million people per year) | Availability of infrastructure (per thousand people per day) |
|---|---|---|---|
| Important tourist places | 238 | - | - |
| Tourist rent houses | 163 | 8.38 | 22.96 |
| Night shelters | 28 | 1.44 | 3.94 |
| Hotels and guest houses | 1993 | 102.47 | 280.73 |
| Dharamshalas | 789 | 40.57 | 111.14 |
| Beds in tourist rest houses | 6562 | 337.38 | 924.32 |
| Beds in night shelters | 1300 | 66.84 | 183.12 |

Even seven years after the creation of the state and despite the potential for all kinds of tourism, the state is not able to attract tourists because of the poor tourism infrastructure. The total number of tourist arrivals in Uttarakhand was 19.45 million in 2006; with the infrastructure facilities currently available the situation is very poor. Table 30 shows that per annum Uttarakhand has only 8.4 tourist rent houses per million tourists, 102.5 hotels and guest houses per million tourists, and 337 beds available for every million tourists.

**Table 31 : Number of tourist arrivals, 2005-06**

| District | Domestic tourists | Foreign tourists | Total |
|---|---|---|---|
| Almora | 225333 | 5101 | 230434 |
| Chamoli | 1670176 | 3078 | 1673254 |
| Pauri Garhwal | 522180 | 9835 | 532015 |
| Pithoragarh | 193947 | 1136 | 195083 |
| Rudraprayag | 493824 | 1092 | 494916 |
| Tehri Garhwal | 591033 | 8699 | 599732 |
| Uttarkashi | 804032 | 1511 | 805543 |
| Dehradun | 2361254 | 20573 | 2381827 |
| Haridwar | 6283726 | 11012 | 6294738 |
| Nainital | 616594 | 12504 | 629098 |
| US Nagar | 67946 | 220 | 68166 |
| Uttarakhand | 13830045 | 74761 | 13904806 |
| Hill districts | 4500525 (32.54) | 30452 (40.73) | 4530977 (32.59) |
| Districts in the plains | 9329520 (67.46) | 44309 (59.27) | 9373829 (67.41) |

*Source: Compiled from district statistics from Monthly Review of Uttaranchal Economy by the Regional Monitoring Service of CMIE.*
*Note: Details on Bageshwar and Champawat are not available.*

At the district level, regions in the plains have relatively better infrastructure. Of the total number of tourists visiting the state, 67 per cent visit regions in the plains and only 33 per cent venture into the hill regions (Tables 31 and 32). In terms of foreign tourists, 40.73 percent go to hill districts and of the domestic tourists 32.54 per cent visit the hills of Uttarakhand.

**Table 32 : Hotel accommodation by district, 2005**

| District | Number of establish-ments | Number of rooms | Number of beds | Rooms per establish-ment | Beds per establish-ment | Av. no. of beds per room |
|---|---|---|---|---|---|---|
| Dehradun | 317 | 6150 | 15283 | 19.4 | 48.2 | 2.5 |
| Haridwar | 22 | 4294 | 9120 | 19.3 | 41.1 | 2.1 |
| Tehri Garhwal | 79 | 706 | 7747 | 8.9 | 98.1 | 11.0 |
| Pauri Garhwal | 131 | 3849 | 16206 | 29.4 | 123.7 | 4.2 |
| Uttarkashi | 132 | 1594 | 3496 | 12.1 | 26.5 | 2.2 |
| Rudraprayag | 155 | 1434 | 4584 | 9.3 | 29.6 | 3.2 |
| Chamoli | 240 | 2527 | 9087 | 10.5 | 37.9 | 3.6 |
| U S Nagar | 47 | 753 | 1464 | 16.0 | 31.1 | 1.9 |
| Nainital | 126 | 2320 | 6094 | 18.4 | 48.4 | 2.6 |
| Champawat | 26 | 257 | 638 | 9.9 | 24.5 | 2.5 |
| Almora | 76 | 815 | 2139 | 10.7 | 28.1 | 2.6 |
| Bageshwar | 27 | 399 | 1057 | 14.8 | 39.1 | 2.6 |
| Pithoragarh | 70 | 679 | 1444 | 9.7 | 20.6 | 2.1 |
| Total | 1648 | 25777 | 78359 | 15.6 | 47.5 | 3.0 |

*Note:* Data includes hotels, guesthouses, ashrams, dormitories and GMVN/KMVN facilities.
*Source*: Tourist Board.

## 4.2 Issues and recommendations for tourism development

The issues that hinder the effective marketing of the state as a tourism destination are lack of awareness of Uttarakhand as a tourism destination; ineffective branding of the state; lack of a marketing strategy and expensive annual campaigns that are not sufficiently focused; development and operational issues; and the virtual non-existence of public-private sector coordination. In the international market there is little awareness of Uttarakhand as a tourism destination with the exception of Rishikesh and Haridwar for religious visitors, Dehradun for being the capital city, Nainital as a hill resort, Udham Singh Nagar for commercial visitors, and Corbett National Park for its famous tiger reserve. However, tourism in the state is making its presence felt in the international market and adventure tour operators are also approaching this region. There is immense potential for tourism in the hill districts (Appendix 7) and developing a coherent plan to attract tourists is of prime importance for the development of the hill region.

### *4.2.1 Infrastructure*

Issues in infrastructure development pertain to transportation, electricity and drinking water supply, telecommunications, emergency services, restaurants and hotels, and waste disposal (these are discussed in detail in the next section).

Transport linkages within the state and to the rest of the country are critical. Urban public transport needs must be addressed within an urban renewal planning

framework. Within the state, buses and taxis need to be added in every district to handle increased passenger loads. In addition, an efficient and competitive level of service should be introduced; routes, schedules and fares should be advertised, tickets should be sold over the Internet, and a variety of transport options offered to provide varying levels of service. To reach inaccessible places, cable cars and ropeways offer an alternative to roads but care must be taken to embed such infrastructure into the scenery to minimize their visual impact. On Tehri Lake a car and passenger ferry service can help cut the travel time between the north and south shores of the lake; this would also serve as a tourist attraction.

Railways, roadways and airways should be developed to link the state with the rest of the country and reduce travel time. Electrification of the remainder of the Delhi-Dehradun line will make travel faster. It is recommended that railway connections should be created between Jolly Grant airport and the Delhi-Dehradun line to allow future rail access to the airport. In addition, schedules and connections in coordination with the Delhi urban rail system should be improved.

No further recommendations beyond those brought forward by the Aviation Master plan has recommended plans for connecting the state with international and national airports. However, air links are being developed and six airplane strips have been proposed in the hills by the government. Helicopters services should also be introduced; for these services, facilities for refueling and hangers within the state have been proposed along with the installation of beacons at major helipads to allow operations during bad weather. These services will attract NRIs and wealthy travelers, increasing the number of tourists and resulting in development.

A frequent criticism is that the positive effects of tourism development do not reach the local population and income generated from this sector might get drained out instead of being utilized within the state. Three types of tourists visit Uttarakhand. High-end tourists come on weekends and spend a lot of money on hired taxis but that does not contribute to the local economy. Pilgrims stay 10-15 days and the money they spend filters down directly to the economy of Uttarakhand. Modern tourists who come for a holiday spend money on their stay, which directly benefits the local population, but they cause pollution, which is at a heavy cost to the environment.

It is important to set up motels on small pieces of land to strength tourism. In tourist areas, toilets and restaurants should be provided. Panchayats (Appendix 8) can be involved to facilitate this construction activity and generate employment within the villages rather than getting laborers from neighboring states.

There is tremendous scope for religious tourism in the Garhwal region. The government should develop the route to Badrinath. Basic facilities for tourists, particularly women and children, need to be developed especially along the Haridwar-Badrinath route (Char dham plan is already with the government) and s*ulabh shauchalays* should be set up every twenty kilometers. Class tourism for NRIs can also be promoted by improving facilities in the region; for this, a public-private partnership model can be developed.

For the Kumaon region, the focus should be general tourism. Currently, the government is implementing a Rs. 12-13 crore project for cleanliness in Nainital and

the Tehri dam area is a potential tourist spot. Cities can be created that focus on medical tourism including medication as well as medication teaching. Spiritual tourism also needs to be leveraged to generate employment for the locals and revenue for the state by creating adequate infrastructure at spiritual destinations. The Vaishno Devi temple model is suitable for Uttarakhand and can prove to be a growth and development driver that adds to the income of the state.

***Vaishno Devi: Model to be followed***

*India has been blessed with diverse religious places and Vaishno Devi is one of them. It has emerged as an economic boon for Katra. The base camp itself generates an income of Rs 474.36 crore per annum. This has been made possible by the Shri Mata Vaishno Devi Shrine Board which was set up in August, 1986. The main objective of the Act was to provide better management and governance of the Holy Shrine of Shri Mata Vaishno Devi Ji and its endowments, including the appurtenant lands and buildings. Since the takeover the Shrine Board has constantly strived to provide all facilities to devotees visiting the Holy Cave Shrine of Shri Mata Vaishno Devi with the result that pilgrimages to this holy place increased tremendously --from 13.95 lakhs to 69.50 lakhs in 2006. Efforts are still ongoing to further improve facilities for pilgrims and provide state-of-the-art facilities in every sphere.*

*Rapid improvement was carried out with board funds. In a short time the entire stretch of track to Bhawan covering a distance of over 12 km. has been laid with tiles and made pucca for the convenience of pilgrims; an alternate track measuring 5.5 km has been constructed and has 70 shelter sheds covering a distance of nearly 4 km. Pilgrims can rest at these shelter sheds, also called Vishram Sthals. A large number of parapets have been constructed and railings provided. Moreover, the entire track has been well illuminated with approximately 1,200 High Power Sodium Vapour (HPSV) lamps Over 100 toilet blocks with more than 600 seats including Western-style toilets have been constructed at regular distances all along the track. A total of 125 water points and 50 water coolers have been installed on the track to make clean drinking water available to the pilgrims. The Board also provides free accommodation for devotees at Adkuwari, Sanjichatt and Bhawan. Many Bhojanalayas that provide wholesome and hygienic food on a no-profit basis are being run at Bhawan, Adhkuwari, Sanjhichhat and at Vaishnavi Dham/Saraswati Dham in Jammu. Well-equipped medical centers manned by professionals have been set up at Banganga, Adhkuwari and Bhawan. There is a 24-hour charitable dispensary at Katra. At Sanjichhat there is a 24-bed hospital with all facilities. Round- the- clock medical facilities including an ICU are available at Bhawan. At all the important locations cloak rooms and blanket stores are available. Ponies, pithus and palanquins are available at fixed rates. A helicopter facility on the Katra-Sanjhichhat route is also available through Deccan Aviation. Banks, police stations, and post offices are available at all important locations.*

To prevent soil erosion, trails, steps, simple drainage channels, and slope protection have to be created. This creates a neat infrastructure and also protects the environment. Along the trail quality rest stops that have toilets and waste disposal facilities should be created. For tourists who are interested in nature walks, walkways need to be created. Frequent pedestrian areas are also proposed. Rope bridges and river crossings provide excursions as well as security for travelers. The existing rope bridges need to be maintained and a similar style followed for new bridges. Low-cost but safe river crossings over seasonal rivers are also suggested.

### *4.2.2 Appropriate Skill Development*

Models like the "Veer Chand Garhwali Programme" should be developed; this is the model of the "Village Inherited Tourism Mode", in which each household has a separate room for tourists, but the government will have to provide funds and investment. This model is also good as a self-employment scheme. To ensure that the benefits of local tourism actually reach the villagers, it is important to involve women in restaurant activities, youths as drivers of taxis and guides, and local uneducated men as porters. There is a need to develop human resources and hold capacity-building training programmes. The supply of competent managers does not meet the demand for mid- and high-level managers and, even at the policy planning level, they are in short supply. There is a shortage of quality institutions and teachers to impart training to the new generation and to upgrade the skills required for foreign tourism. The level of education is quite good but there are a large number of unemployed educated youth in the hills. There is an immediate need o improve the communication skills of personnel in the hospitality industry. There is a similar requirement for organizing local training of personnel employed at front offices, housekeeping, food production, restaurant services, travel agencies, etc. These training programmes can be organized off-season. To meet the manpower requirements of the accommodation sector alone, the state should set up at least one training institute without any further loss of time. Skills in English and other languages should be given high priority.

### *4.2.3 Government policies*

There is potential to re-use the existing local resources to develop tourism in Uttarakhand. The social and cultural environment of the state is prepared to take up tourism as a major opportunity to create jobs. Though tourism is considered to be an industry, the benefits are not accessible to the state. There is still no proper tourism management plan; added to it is the problem of lack of connectivity. In Uttarakhand, the tax load on tourist vehicles is much higher than that in other states like Himachal Pradesh and Jammu & Kashmir (Table 32). Also, these states charge a single entry tax, unlike Uttarakhand which charges tax at multiple points. Therefore, tour operators discourage tours to Uttarakhand. Hence, there is a need to reduce the tax differences to tap the tourist potential of the state when there is competition from other states.

**Table 33 : Taxes per day on tourist vehicles in Uttarakhand and neighboring states**

*(Unit: In Rupees)*

| State | Bus | Small vehicle | Times tax is paid |
|---|---|---|---|
| Himachal Pradesh | 333 | 130 | Single entry tax |
| Jammu & Kashmir | 300 | 120 | Single entry tax |
| Uttarakhand | 1800 | 350 | Multiple places tax |

## 5. Developing Infrastructure

In the earlier sections of the paper, it has been repeatedly envisaged that infrastructure development is one of the biggest constraints that the state faces for its development and growth. The situation of infrastructure is even worse in the hill regions because of the difficult terrain. The major infrastructural issues to be discussed are drinking water and irrigation facilities, electricity, transportation and communication facilities, banking infrastructure, and social infrastructure like housing and education (Appendices 8 and 9).

### 5.1 Water Issues: Drinking water and irrigation

Uttarakhand has acute water scarcity. Water is a problem both for drinking and for irrigation. The high population growth in Uttarakhand over the decades has placed enormous pressure on its natural resources, mainly forests. The forest cover has been significantly reduced both in density and area, which has created other serious problems like soil erosion and loss of water-storage capacity in the hill areas. It has increased the scarcity of water as the natural springs started drying. Increased loss of top-soil (soil erosion) combined with a drop in already poor irrigation facilities have affected agriculture and the large population dependent on it. Further, it has added to the plight of the hard-working women for whom natural water sources provide water for daily household use.

The government of Uttarakhand has been working on various programmes and plans to rectify the problem. A comparative analysis of the performance of five different approaches to meeting the drinking water needs of the rural areas shows that the traditional community management approach performs best. However, all the approaches failed to achieve equity in access to drinking water. It is recommended that the issue of drinking water supply must be part of integrated water resources management, and water resources management itself must be part of an integrated natural resource management plan, based on a watershed development approach[22]. Panchayati Raj institutions must play an active role regarding control and management of water, land, and forest resources.

At present in Uttarakhand drinking water supplies are available to 15,545 villages, covering about 64.65 lakhs of the population. At the district level, the coverage of drinking water supply seems to be very good in Rudraprayag with almost 100 per cent of the population covered (Table 34). However, in other hill districts the situation is not so good. The worst are the districts of Champawat and Uttarkashi where only 75 per cent and 80 per cent of the population, respectively, have access to drinking water.

[22] Watershed refers to a contiguous area draining into a single water body or a water course or it is a topographical area having a common drainage. This means that the rainwater falling on an area coming within a ridgeline can be harvested and will flow out of this area through a single point. Some refer it as a catchment area or river basin.

**Table 34 : Drinking water supplies in hill districts of Uttarakhand, 2004**

| Hill districts | Population covered (no.) | Per cent of population covered | Number of villages | |
|---|---|---|---|---|
| | | | Fully covered | Partially covered |
| Almora | 577545 | 91.6 | 2127 | 28 |
| Bageshwar | 233285 | 93.5 | 845 | 13 |
| Chamoli | 315377 | 85.2 | 1154 | - |
| Champawat | 169011 | 75.3 | 642 | 9 |
| Pauri Garhwal | 606033 | 86.9 | 3098 | 2 |
| Pithoragarh | 399922 | 86.5 | 1553 | 13 |
| Rudraprayag | 250891 | 100.0 | 652 | - |
| Tehri Garhwal | 543843 | 89.9 | 1760 | - |
| Uttarkashi | 235016 | 79.7 | 583 | - |

*Source*: Sankhyakik Patrika, 2004-05.

Since agriculture is the main source of livelihood, irrigation infrastructure is one of the prime requirements for Uttarakhand. The major sources of irrigation in Uttarakhand are the canal system, tube wells, lift irrigation, ghuls (hill channels), water-harvesting tanks (hauzas), hydrams, shallow tube wells and deep tube wells in the Tarai belt. The gross irrigated area of the state is 549,345 ha and the net irrigated area is 337,696 ha (Table 35), of which only 12 per cent is in the hill districts and 88 per cent in the plains. Of the total area irrigated through various irrigation sources, the hill districts have 19.6 per cent of the state's canal-irrigated area, 52 per cent of the state's tank-irrigated area and 60 per cent of the state's area irrigated by other sources. Only 44 per cent of the cropped area is irrigated by the present irrigation system of which about 81 per cent is in the plains (Table 36).

**Table 35 : Area under irrigation and different sources of irrigation in districts of Uttarakhand, 2004-05**

*(Unit: in hectare)*

| Districts | Canals | Tanks/ Ponds | Tube wells | Other sources | Net irrigated area | Gross irrigated area |
|---|---|---|---|---|---|---|
| Almora | 2982 | 0 | 0 | 2006 | 4988 | 9832 |
| Bageshwar | 2724 | 0 | 0 | 1279 | 4003 | 7943 |
| Chamoli | 1044 | 118 | 0 | 423 | 1585 | 2928 |
| Champawat | 1657 | 252 | 120 | 352 | 2381 | 4283 |
| Pauri Garhwal | 3602 | 0 | 613 | 3492 | 7707 | 14271 |
| Pithoragarh | 633 | 147 | 0 | 3182 | 3962 | 7056 |
| Rudraprayag | 1961 | 0 | 0 | 656 | 2617 | 5100 |
| Tehri Garhwal | 947 | 0 | 0 | 7572 | 8519 | 16296 |
| Uttarkashi | 3166 | 0 | 0 | 1894 | 5060 | 9084 |
| Dehradun | 12038 | 325 | 3266 | 5235 | 20864 | 33660 |
| Haridwar | 14476 | 96 | 90667 | 1925 | 107164 | 150269 |
| Nainital | 23292 | 0 | 4262 | 462 | 28016 | 40153 |
| US Nagar | 27198 | 61 | 107301 | 6270 | 140830 | 248470 |
| **Hills** | 18716 (19.6) | 517 (51.8) | 733 (0.4) | 20856 (60.0) | 40822 (12.1) | 76793 (14.0) |
| **Plains** | 77004 (80.4) | 482 (48.2) | 205496 (99.6) | 13892 (40.0) | 296874 (87.9) | 472552 (86.0) |
| **Uttarakhand** | 95720 | 999 | 206229 | 34748 | 337696 | 549345 |

*Source: Directorate of Economics & Statistics, Ministry of Agriculture, Govt. of India*

**Table 36 : Irrigation profile of Uttarakhand, 2005**

| Districts | Net cropped area (Ha) | Net irrigated area (Ha) | % of net irrigated area from net cropped area | Share in total irrigated area |
|---|---|---|---|---|
| Almora | 82605 | 4988 | 6.0 | 1.5 |
| Bageshwar | 21718 | 4003 | 18.4 | 1.2 |
| Chamoli | 34869 | 1585 | 4.5 | 0.5 |
| Champawat | 25400 | 2381 | 9.4 | 0.7 |
| Pauri Garhwal | 80677 | 7707 | 9.6 | 2.3 |
| Pithoragarh | 48072 | 3962 | 8.2 | 1.2 |
| Rudraprayag | 19983 | 2617 | 13.1 | 0.8 |
| Tehri Garwal | 61256 | 8519 | 13.9 | 2.5 |
| Uttarkashi | 27363 | 5060 | 18.5 | 1.5 |
| Dehradun | 46972 | 20864 | 44.4 | 6.2 |
| Haridwar | 120159 | 107164 | 89.2 | 31.7 |
| Nainital | 46584 | 28016 | 60.1 | 8.3 |
| Udham Singh Nagar | 151072 | 140830 | 93.2 | 41.7 |
| **Hills** | **401943** | **40822** | **10.2** | **12.1** |
| **Plains** | **364787** | **296874** | **81.4** | **87.9** |
| **Uttarakhand** | **766730** | **337696** | **44.0** | **100.0** |

*Source: Directorate of Economics & Statistics, Ministry of Agriculture, Govt. of India*

**Table 37 : Status of Irrigation Infrastructure, 2004**

| Districts | Length of canals (km) | Tube wells (State) (no.) | Pump sets (no.) | Area under irrigation (%) |
|---|---|---|---|---|
| Almora | 538 | | | 5.94 |
| Bageshwar | 382 | | | 18.85 |
| Chamoli | 383 | | | 5.11 |
| Champawat | 217 | 10 | | 8.55 |
| Pauri Garhwal | 928 | 102 | 980 | 9.58 |
| Pithoragarh | 401 | | | 9.66 |
| Rudraprayag | 269 | | | 12.08 |
| Tehri Garhwal | 519 | | 19 | 14.98 |
| Uttarkashi | 661 | | | 16.06 |

In the hill regions the irrigation infrastructure is very poor (Table 37). A large portion of the agricultural area is situated above rivers, with the result that they cannot be irrigated using the gravity system (surface water system) and can only be irrigated through lift irrigation. The lift irrigation technique is sophisticated and cost-effective; it is implemented through an automatic pumping device known as a hydraulic ram pump or hydram. Hydrams, which do not use any external energy or power such as diesel or petrol, work on the principle of the water hammer and convert the available static head to kinetic energy. Water can be carried to a height of 30 times above the available head. However, to make more water available for irrigation and to reduce the wear and tear on the plant, for the time being the department is trying to lift water

only up to 15 times the height of the head. The lift irrigation technique can act as an important tool to improve the status of irrigation in Uttarakhand, in particular the hill districts. The advantage is that the land below the supply channel (guhls) can be irrigated directly from the supply channel; in addition, by increasing the scale of the supply channel, water mills for grinding wheat and other cereals can be driven. Consequently, dependence on power and diesel will be reduced, new employment opportunities will be created, the nutritional value of the cereals will remain intact, and labor will be saved. Also, the maintenance expense is minimal and has no adverse impact on the environment.

A traditional but effective canal irrigation system (guhls) is used to irrigate the fields using gravitational force which brings water from a distance of many kilometers. These guhls were maintained by the local beneficiaries until they were taken up by the minor irrigation department of the state government. Another traditional irrigation method which is prominent in Uttarakhand is water mills. The water mills, known as gharats in Uttarakhand, have traditionally been used for milling grain and extracting oil. The estimated number of water mills varies from 3,500[23] to 70,000. These water mills, with little technological upgradation, can also be employed for hydropower generation. Now, the water millers have an increased level of awareness and access to the technology required to upgrade water mills to be used as micro/small hydropower plants. NGOs like HESCO have been instrumental in successfully implementing several micro-hydropower projects in the state. The contribution of institutions like HESCO for promoting water mills to generate hydropower is significant and noticeable, especially since government efforts in this direction have not produced the desired results. Public sector organizations found these micro-plants too expensive and were unable to recover the costs; thus, financially these were not viable in the long term. The NGO approach basically involves large-scale community participation which makes the installation as well as running of the micro-plant economical. This results in the sustainability of the plant after it is completed. The grain milled by these micro-hydro plants, gharats, are being sold in the market under the brand name Gharat flour which has been well-received by customers. The use of the water mills as micro-hydropower plants will not only meet the consumer power requirements at remote villages but also generate a vocation for the people. Definitely, it is one of the main avenues for sustainable and inclusive development of the hill regions.

### 5.2 Electricity and other sources of power

Electricity consumption in the domestic sector of Uttarakhand has been quite substantial and higher than the country's average, but over the years this proportion has shifted in favor of the industrial sector. In 2001-02 around 45 per cent of the total electricity consumption was in the domestic sector which dropped to 29 per cent by 2006-07. With the increasing demand from the industrial sector, in 2006-07 almost 40 per cent of the total electricity consumption was by industries (Table 38). The share of electricity consumption for farming purposes has declined substantially from 14.4 per cent in 2001-02 to 9.9 per cent although the total actual electricity consumption has marginally increased.

The consumption of electricity in different sectors in the hill regions is shown in Table 39. However, of the total state electricity consumption very little is consumed

[23] Dewan and Bhadur (2005)

by the hill districts. It is mainly four districts in the plains where electricity consumption is the maximum. This shows the poor situation of electrification in the hill districts of Uttarakhand.

**Table 38 : Electricity consumption by different sectors**

*(Unit: M.U. Watt)*

| Sectors | Uttarakhand | | India | |
|---|---|---|---|---|
| | **2001-02** | **2006-07** | **2001-02** | **2005-06** |
| Domestic | 996.26 (44.7) | 1126.99 (29.0) | 79,694,000.0 (24.7) | 103,368,000.0 (24.9) |
| Commercial | 254.20 (11.4) | 582.63 (15.0) | 24,139,000.0 (7.5) | 34,761,000.0 (8.4) |
| Industrial | 475.90 (21.4) | 1569.73 (40.4) | 107,296,000.0 (33.3) | 149,092,000.0 (35.9) |
| Agriculture | 321.17 (14.4) | 385.62 (9.9) | 81,673,000.0 (25.3) | 95,685,000.0 (23.0) |
| Others | 181.57 (8.2) | 220.99 (5.7) | 29,657,000.0 (9.2) | 32,393,000.0 (7.8) |
| **Total** | **2229.09** | **3885.96** | **322459000.00** | **415299000.00** |

*Note: Others include street lighting, water works and traction & railways. Figures in parentheses are the per cent share.*

*Source:Indiastat (www.indiastat.com) Outsourced from Ministry of Statistics and Programme Implementation, GOI and Uttarakhand Power Corporation Limited.*

**Table 39 : Profile of electricity consumption in the hill districts, 2006-07**

*(Unit: Thousand killowatt*)

| Indicator Specification | Domestic | Commercial | Industrial | Agriculture | Others | Electricity consumption |
|---|---|---|---|---|---|---|
| Almora | 58584 | 11115 | 1613 | 781 | 16523 | 88616 |
| Bageshwar | 15408 | 3766 | 2654 | 444 | 775 | 23047 |
| Chamoli | 43644 | 3520 | - | 640 | 305 | 48109 |
| Champawat | 14706 | 4216 | 1560 | 225 | 372 | 21079 |
| Pauri Garhwal | 38746 | 8062 | 1230 | 369 | 16176 | 64583 |
| Pithoragarh | 31850 | 3742 | 557 | 836 | 6851 | 43836 |
| Rudraprayag | 12196 | 1459 | 593 | 897 | 14 | 15159 |
| Tehri Garhwal | 31137 | 73713 | 41853 | 604 | 6216 | 153523 |
| Uttarkashi | 48660 | 3128 | 3098 | 1360 | 43 | 56289 |
| Uttarakhand | 1036480 | 539780 | 1230020 | 406700 | 224540 | 3437520 |
| **Per cent share of hill districts** | **2.85** | **2.09** | **0.43** | **0.15** | **2.11** | **1.50** |

Around 96 per cent of the rural villages in Uttarakhand are provided with electricity by Uttarakhand Power Corporation Ltd. UREDA, Micro-Hydel and Kuteer Jyoti connections are also prevalent but in less so in villages. Table 40 presents the status of electrified villages in districts of Uttarakhand. Of the hill districts only Pauri has 20 per cent of its villages electrified by Uttarakhand Power Corporation Ltd. and 10.5 per cent by Kuteer Jyoti connections. Almora and Tehri Garhwal have about 13 percent and 7-9 per cent villages electrified through these two sources of electrification. The status of village electrification in the remaining hill districts is very poor.

**Table 40 : Rural electrification in districts of Uttarakhand, 2006-07**

| Districts | Number of villages electrified under | | | Per cent share of villages electrified | | |
|---|---|---|---|---|---|---|
| | Uttarakhand Power Corporation Ltd. | Energised pump set/ tube well | Kuteer Jyoti connections | Uttarakhand Power Corporation Ltd. | Energised pump set/ tube well | Kuteer Jyoti connections |
| Almora | 1994 | 0 | 11034 | 13.66 | 0.00 | 7.93 |
| Bageshwar | 781 | 0 | 6922 | 5.35 | 0.00 | 4.97 |
| Chamoli | 983 | 0 | 11340 | 6.73 | 0.00 | 8.15 |
| Champawat | 634 | 1 | 5864 | 4.34 | 0.01 | 4.21 |
| Pauri Garhwal | 2956 | 2 | 14585 | 20.25 | 0.01 | 10.48 |
| Pithoragarh | 1340 | 0 | 14029 | 9.18 | 0.00 | 10.08 |
| Rudraprayag | 498 | 0 | 9461 | 3.41 | 0.00 | 6.80 |
| Tehri Garhwal | 1805 | 0 | 12650 | 12.36 | 0.00 | 9.09 |
| Uttarkashi | 653 | 0 | 9498 | 4.47 | 0.00 | 6.82 |
| Dehradun | 757 | 434 | 15308 | 5.18 | 2.19 | 11.00 |
| Nainital | 1068 | 384 | 8032 | 7.31 | 1.93 | 5.77 |
| US Nagar | 653 | 11183 | 10736 | 4.47 | 56.32 | 7.71 |
| Haridwar | 479 | 7853 | 9713 | 3.28 | 39.55 | 6.98 |
| **Uttarakhand** | **14601** | **19857** | **139172** | **100.00** | **100.00** | **100.00** |

*Source: Uttarakhand Power Corporation Ltd.*

Power supply through the grid system to interior villages in mountainous terrain is expensive and challenging due to poor load characteristics, adverse topographical features, harsh weather conditions, scattered households and low population density. Though there are problems related to the financial viability of such decentralized power generation by the public sector, non-government community efforts have proved to be a success. A national-level NGO, Foundation for Rural Recovery and Development (FORRAD), has helped set up two community-owned hydropower stations of 20 kw in Tehri Garhwal district. Poor people, who cannot afford electricity under government schemes, contribute labour and marginal cash as their contribution to their community's efforts to get access to reliable and cheap electricity. The key to the success of these power stations is community participation, willingness to work persistently by building local capability to maintain the unit, and making full use of this power either by using it themselves or by selling surplus power to the national grid.

Uttarakhand has got enormous potential for hydropower generation. Apart from its large and medium hydropower potential, which is estimated to be 20,000 megawatts, it also has huge potential for small, mini- and micro- hydropower generation[24]. An estimate puts the overall hydropower potential of the state at 40,000 megawatts. The hydropower potential of the state can be harnessed for its development and to raise the quality of life of its people. Hydro-electric power generation provides electricity at a cheaper price and in an environment-friendly manner. This crucial price advantage of hydropower electricity may act as a catalyst for the economic development of the state and its people by increasing their purchasing power.

Availability of cheap power by way of inexpensive water lifting systems for irrigation will boost agriculture. It will also encourage establishing agro-processing units such as milling, drying, and threshing, and cultivators will be able to process the crops in the village. Fiber-processing, and other processing activities like carding, spinning, dyeing, drying, and calendaring can be mechanized with small-scale technology to reduce the processing time by at least a third. Availability of cheap power coupled with appropriate technology for processing fibers will enable people to add value at competitive rates. Availability of low-cost power, particularly in remote areas, can be instrumental in providing basic comforts and facilities sought by tourists, which will in turn will help attract more tourists to the region. If sufficient low-cost electricity is available, it will act as an incentive for people to use it for cooking and heating, rather than using wood (currently, around 80 per cent of the people use wood as fuel); this will help protect the forests and environment. Better-conceptualized initiatives and planned management of the existing watermill resources of Uttarakhand can give effective results for power generation for domestic use.

Alternative energy sources like solar energy should be encouraged. HESCO has demonstrated certain advances in this source of energy. An investment in this direction can be both a cheaper and more eco-friendly source of electrification. Solar installations should be complemented with battery banks. Solar installations that are connected to the grid must be allowed to feed electricity into the grid and compensated at the same rates they pay for electricity consumption. It is important to decentralize energy generation to overcome transmission impasses. Since the climate

[24] Kumar, 2005

of Uttarakhand is cold, it is important to propagate solar water heaters and reduce the reliance on electric water heaters, thereby helping electricity suppliers to overcome shortages. Due to the mountain terrain, it is difficult to transport CNG and LGP cylinders for cooking; in these cases also solar cookers and solar panels can be used.

### 5.3 Transportation and Communication

Roads and connectivity with other regions, villages and states is a big problem in Uttarakhand hill regions. The main problem is the maintenance of the roads due to heavy rainfall, soil erosion and even snow fall in certain regions. Road maintenance is usually undertaken by the PWD but as seen in Table 41, in the case of hill districts the maintenance is usually done by urban local bodies and district panchayats are not involved. In terms of road infrastructure, only Almora, Pauri and Uttarkashi are linked to national highways. District roads are the fewest, but indicators to judge their quality and all-weather usage are not available.

**Table 41 : Status of roads in hill districts of Uttarakhand, 2003**

*(Unit: in Kilometers)*

| Hill Districts | Length of the road maintained by | | | Length of the road linked with | | | |
|---|---|---|---|---|---|---|---|
| | PWD | District panchayats | Urban local bodies & Others | National highways | State highways | Major district roads | Other district and rural roads |
| Almora | 129 | | 46 | 105 | 203 | 1253 | |
| Bageshwar | | | | | 36 | 162 | 253 |
| Chamoli | | | 147 | | 64 | 62 | 680 |
| Champawat | | 7 | | | 15 | 54 | 390 |
| Pauri Garhwal | | | 53 | 54 | 323 | 114 | 2413 |
| Pithoragarh | | | 5 | | 98 | 23 | 429 |
| Rudraprayag | | | | | | | |
| Tehri Garhwal | | | 123 | | 74 | 161 | 1067 |
| Uttarkashi | | | 28 | 95 | 46 | 51 | 872 |

It is important to link these districts with one another, state highways and national highways, because only after the roads are constructed is it possible to link them with the markets, which are a must for the development of agriculture and allied sectors. It is recommended that Uttarakhand should be linked with the freight corridor. Between the villages of the hill districts, a simple and cost-effective trolley system should be introduced, because road transport fails when it rains or snows. This will also help develop every district, town and village as a tourism hub and provide employment. Roads connections and maintenance should be given priority and all the important destinations of each district should be linked; moreover, the responsibility should be assigned to a single agency at a decentralized level.

The infrastructure of communications services in the hill regions is also poor. Table 42 shows that around 76 per cent of the state's post offices are in the hill regions. Pauri has the maximum number of post offices while Champawat has the fewest. Telegraph office coverage is only 25 per cent in the hills and only 26 percent of the

public telephones are found in the hill regions. BSNL also covers only 26 per cent of their total connections in the hill regions. BSNL connections work in all areas but there are no Hutch or Airtel connections. However, a revolution in communication services through mobile phones is expected soon.

**Table 42 : Communication infrastructure in hill districts of Uttarakhand, 2005**

| Hill Districts | Post offices | Telegraph offices | PCOs | BSNL telephone connections |
|---|---|---|---|---|
| Almora | 316 | 2 | 1005 | 27162 |
| Bageshwar | 150 | 1 | 392 | 3211 |
| Chamoli | 265 | 3 | 503 | 7556 |
| Champawat | 78 | - | 173 | 5415 |
| Pauri Garhwal | 427 | 23 | 588 | 21253 |
| Pithoragarh | 318 | 9 | 461 | 13854 |
| Rudraprayag | 123 | 1 | 164 | 4764 |
| Tehri Garhwal | 259 | 2 | 375 | 16841 |
| Uttarkashi | 132 | 1 | 179 | 8090 |
| Uttarakhand | 2719 | 163 | 14577 | 404163 |
| **% Share of hill districts** | 76.06 | 25.77 | 26.34 | 26.76 |

## 5.4 Banking Sector

In 2005-06, Uttarakhand was served by 285 branches of the State Bank of India (SBI) and its associate offices as against 14,016 branches in India. The offices of Regional Rural Banks (RRBs) in the state declined from 177 in 2001-02 to 171 in 2005-06; this decline was also observed for their branches in the country (Table 43). Other private commercial banks registered a growth of 12 per cent in Uttarakhand, whereas they increased by only 4 per cent in the country.

**Table 43 : Number of bank offices**

| Banks | Uttarakhand | | India | |
|---|---|---|---|---|
| | 2001-02 | 2005-06 | 2001-02 | 2005-06 |
| SBI and its associates | 276 | 285 | 13641 | 14016 |
| Nationalized banks | 370 | 407 | 33842 | 35225 |
| Regional Rural Bank (RRBs) | 177 | 171 | 14664 | 14607 |
| Other private commercial banks | 34 | 55 | 5549 | 6683 |

*Source: Reserve Bank of India.*

SBI is the leading bank in all nine hill districts of Uttarakhand and mainly supports agricultural and industrial activities in these districts. It even provides loans to the landless. It is trying to achieve the objective of 100 per cent financial inclusion in the state. Through this scheme Chamoli, Pithoragarh and Nainital achieved 100 per cent financial inclusion in 2007 and Rudraprayag, Champawat, Haridwar and Dehradun

are expected to achieve it in the first quarter of 2008. SBI has adopted several different methods to achieve financial inclusion. It opens a zero balance account, provides a general purpose credit card, and a kisan card to hill people; a loan of Rs. 25,000 is provided to hill people without asking for collateral; at Pithoragarh the bank. has undertaken a project where they are provide tiny SBI cards through mobile phones; it provides biometric cards that stores the customer's photo and data in a chip; and it provides Customer Service Points (CSPs) that are clustered around villages. Since there is a problem with road connectivity, SBI is trying to link households with the banks through mobile phones that get connected with the bank's server; this way, customers can make bank transactions through their mobile phones. These steps by the SBI are very helpful for the hill people of the state.

However, wide disparities still exist between the plains and the hill regions in terms of banking structure in Uttarakhand (Table 44). The presence of banks remains quite low in the hill districts except for Pauri Garhwal.

**Table 44 : District wise Bank offices in Uttarakhand (As on September 2007)**

| District | SBI and its associates | Nationalised banks | RRBs | Other private commercial banks | All banks |
|---|---|---|---|---|---|
| Almora | 29 | 22 | 19 | 2 | 72 |
| Bageshwar | 9 | 3 | 12 | 2 | 26 |
| Chamoli | 20 | 4 | 10 | – | 34 |
| Champawat | 8 | 3 | 4 | 5 | 20 |
| Pauri Garhwal | 36 | 31 | 33 | 1 | 101 |
| Pithoragarh | 26 | 2 | 21 | 1 | 50 |
| Rudraprayag | 13 | 3 | 4 | – | 20 |
| Tehri Garhwal | 29 | 18 | 19 | – | 66 |
| Uttarkashi | 15 | 8 | 3 | – | 26 |
| Dehra Dun | 37 | 138 | 11 | 14 | 200 |
| Haridwar | 21 | 87 | 1 | 5 | 114 |
| Nainital | 14 | 44 | 19 | 17 | 94 |
| Udham Singh Nagar | 26 | 61 | 8 | 20 | 115 |
| **Uttarakhand** | **283** | **424** | **164** | **67** | **938** |

*Source: Reserve Bank of India.*

The status of loan disbursements through financial institutions in the hill districts of Uttarakhand is presented in Table 45. Of the total loans, the share that goes to agriculture and related activities varies across districts. While Bageshwar and Tehri Garhwal account for 55 per cent and 60 per cent, respectively of the total loan towards their agricultural activities, the share of loans disbursed to these activities in Pauri is almost negligible. Instead, Pauri Garhwal has around 45 per cent of the total loans disbursed for the development of small-scale industries and 54 per cent for other activities.

**Table 45 : Loan disbursement, 2004**

| District | Loans in thousand rupees | | | Per cent share of district loans between activities | | |
|---|---|---|---|---|---|---|
| | Agriculture and related work | Small-Scale industry | Others | Agriculture and related work | Small-Scale industry | Others |
| Almora | 158363 | 85589 | 655267 | 17.6 | 9.5 | 72.9 |
| Bageshwar | 28000 | 15190 | 8000 | 54.7 | 29.7 | 15.6 |
| Chamoli | 128900 | 46300 | 278200 | 28.4 | 10.2 | 61.4 |
| Pauri Garhwal | 3292 | 338115 | 408116 | 0.4 | 45.1 | 54.5 |
| Pithoragarh | 75975 | 21942 | 256495 | 21.4 | 6.2 | 72.4 |
| Rudraprayag | 14128 | 7416 | 85805 | 10.3 | 5.4 | 62.5 |
| Tehri Garhwal | 840250 | 141006 | 401418 | 60.8 | 10.2 | 29.0 |
| Uttarkashi | 95505 | 8858 | 156034 | 36.7 | 3.4 | 59.9 |

*Note: Details for Champawat are not available*

This low loan disbursement for agricultural activities can be one reason for low development of the hill regions. Uttarakhand has the lowest Credit Deposit Ratio (CDR) in central India. CDR is the proportion of loan-assets created by banks from the deposits received; the higher the ratio, the higher the loan-assets created from deposits. To explain the poor credit disbursal, banks claim that there are few bankable projects worth lending to in the state. It can be seen that poor CDR is a consequence of poor development of the state, particularly the hill districts. In the hill regions the low CDR is not due to the small number of credit accounts, but the relatively small average amount in such accounts. With the objective of 100 per cent financial inclusion, servicing a large number of small accounts entails higher costs than servicing a few large loans.

**Table 46 : Credit Deposit Ratio (CDR), 2007**

| Hill Districts | Credit Deposit Ratio (%) |
|---|---|
| Almora | 25.36 |
| Bageshwar | 23.88 |
| Chamoli | 25.00 |
| Champawat | 24.00 |
| Pauri-Garwal | 20.30 |
| Pithoragarh | 27.00 |
| Rudraprayag | 25.00 |
| Tehri-Garwal | 20.73 |
| Uttarkashi | 34.09 |
| Uttarakhand | 45.00 |

*Source: Potential Linked Credit Plan 2007-08 (different districts), NABARD*

Table 46 shows that all the hill districts have a CDR that is lower than the state average. To improve the CDR it is important to know if there is sufficient demand for loans or whether people go to the informal sector to meet their credit needs. Another factor to be considered is that hill district people do not go to the banks because of the difficulty in approaching them. A third reason is that people are not aware of the possibility of collateral-free lending for their entrepreneurial endeavours. Whatever the reasons, the result is that low CDR hampers the development of the region. SIDBI's credit guarantee scheme can be used to overcome the difficulty of providing collateral security.

Besides the SBI, NABARD also plays an important role in the growth and development of the hill districts. NABARD focuses on the development of rural India by facilitating credit flow to promote agriculture and the rural non-farm sector. It prepares a Potential Linked Credit (PLP) plan annually for each district of the country by assessing the potential of the agriculture and rural sector. This serves as a guide for banks and government agencies to prepare their own investment and credit plans in the district and state. The PLP for the hill districts of Uttarakhand is presented in Table 47. A summary of the table is given below, showing that in particular sectors the specified districts have the highest potential for the development of certain activities and sectors.

| **Sectors/ Activities** | **Districts with highest credit potential** |
|---|---|
| **Minor irrigation** | Almora, Pithoragarh |
| **Farm mechanization** | Pauri |
| **Plantation & Horticulture** | Almora, Pauri, Tehri, Chamoli |
| **Dairy** | Almora, Pauri, Tehri, Uttarkashi |
| **Poultry** | Pithoragarh and Tehri |
| **Sheep/Goat/Pigs/Angora Rabbits** | Pauri |
| **Fisheries** | Champawat and Pithoragarh |
| **Storage go-downs/ Market yards** | Chamoli |
| **Renewable sources of energy & Waste utilization** | Uttarkashi |
| **Non-Farm sector** | Almora, Pauri, Pithoragarh, Tehri |
| **Agro & Food processing** | Chamoli |
| **Other agricultural activities** | Bageshwar |

**Table 47 : Sector-Wise and district-wise PLP projections for bank loans in hill districts of Uttarakhand (2007-08)**

*(Unit: Rs. Lakh)*

| Sectors | Almora | Bageshwar | Chamoli | Champawat | Pauri-Garwal | Pithoragarh | Rudraprayag | Tehri-Garwal | Uttarkashi |
|---|---|---|---|---|---|---|---|---|---|
| Minor irrigation | 55.08 | 18.63 | 11.18 | 21.66 | 17.49 | 49.20 | 2.45 | 23.96 | 22.78 |
| Land development | 60.39 | 26.83 | 5.51 | 17.06 | 27.81 | 28.07 | 14.99 | 38.01 | 27.75 |
| Farm mechanization | 21.60 | 10.44 | - | 20.45 | 97.88 | 13.48 | 3.06 | 0.00 | 13.50 |
| Plantation & Horticulture | 82.24 | 36.63 | 65.28 | 34.05 | 68.68 | 45.43 | 20.89 | 142.80 | 30.77 |
| Forestry & Wasteland development | 16.02 | 7.34 | 2.23 | 3.20 | 16.53 | 3.20 | 18.05 | 17.40 | 4.72 |
| Dairy | 870.53 | 357.30 | 491.79 | 247.76 | 1084.81 | 557.13 | 358.83 | 1289.19 | 729.62 |
| Poultry | 24.39 | 21.60 | 15.39 | 28.06 | 30.56 | 65.68 | 1.61 | 58.23 | 11.12 |
| Sheep/Goats/Pigs/Angora rabbits | 40.93 | 23.81 | 79.20 | 10.60 | 338.16 | 41.79 | 6.07 | 24.51 | 41.78 |
| Fisheries | 7.24 | 6.30 | 6.78 | 23.22 | 15.30 | 26.69 | 1.60 | 14.04 | 1.33 |
| Storage go-downs/ Market yards | 3.60 | 1.80 | 24.00 | 2.00 | 5.00 | 2.00 | 3.60 | 0.00 | - |
| Renewable sources of energy & Waste utilization | 0.92 | 0.92 | 3.60 | 4.37 | 0.60 | 6.00 | 2.08 | - | 14.09 |
| Other (agriculture) | 411.30 | 221.85 | 32.18 | 23.48 | 886.50 | 49.98 | 8.87 | 179.70 | 65.77 |
| **Total agricultural term loans** | **1594.24** | **733.45** | **737.14** | **435.92** | **2589.32** | **888.55** | **442.09** | **1787.83** | **963.23** |
| Crop loans | 1856.00 | 689.40 | 1106.29 | 903.76 | 1451.93 | 1606.38 | 669.57 | 2285.95 | 1685.00 |
| **Total agricultural credit** | **3450.24** | **1422.85** | **1843.43** | **1339.68** | **4041.25** | **2494.93** | **1111.67** | **4073.78** | **2648.23** |
| Non-Farm sector | 673.20 | 378.00 | 252.99 | 366.32 | 504.45 | 512.12 | 231.77 | 651.31 | 273.96 |
| Other priority sectors | 6322.50 | 2668.50 | 4084.49 | 3270.00 | 6975.45 | 8030.00 | 2600.10 | 5015.00 | 2817.00 |
| Agro & Food Processing | 12.60 | 7.20 | 137.70 | 25.65 | 30.00 | 21.00 | 18.90 | - | - |
| **Grand Total** | **10458.54** | **4476.55** | **6318.61** | **5001.65** | **11551.15** | **11058.04** | **3962.44** | **9740.09** | **5739.19** |

*Source: Potential Linked Credit Plan 2007-08 (all districts), NABARD*
*Note: Total Agricultural Credit = Term Loan + Crop Loan; Grand Total= Total Priority Sector, i.e., Agriculture + Non-Farm Sector + Other Priority Sectors*

**Table 48 : Micro-Finance profile in the districts of Uttarakhand**

| Number | Almora | Bageshwar | Chamoli | Champawat | Pauri Garwal | Pithoragarh | Rudraprayag | Tehri Garwal | Uttarkashi |
|---|---|---|---|---|---|---|---|---|---|
| Blocks in district | 11 | 3 | 9 | 4 | 15 | 8 | 3 | 9 | 6 |
| Blocks where SHGs exist | 11 | 3 | 9 | 4 | 15 | 8 | 3 | 9 | 6 |
| Blocks where SHGs are credit-linked | 11 | 3 | 9 | 4 | 15 | 8 | 3 | 9 | 6 |
| NGOs in the district | 35 | 14 | 43 | 20 | - | 30 | 15 | 50 | >100 |
| NGOs in the district participating in the linkage program. | 35 | 11 | 12 | 7 | 13 | 11 | 12 | 25 | 23 |
| Additional NGOs to get involved | 3 | 1 | 7 | 2 | 10 | 4 | 3 | 10 | 1 |
| Bank branches in the district | 89 | 30 | 49 | 28 | 115 | 65 | 26 | 93 | 39 |
| Branches in the district participating in the linkage program | 89 | 30 | 32 | 26 | 82 | 63 | 26 | 90 | 37 |
| Additional branches to get involved | 0 | 0 | 17 | 2 | 20 | 1 | 0 | 3 | 1 |
| Banks acting as SHPI* | 2 | 2 | 1 | 1 | 2 | 1 | 0 | | 1 |
| Government/other agencies participating | 3 | 2 | 4 | 2 | 5 | 6 | 3 | 3 | 4 |
| Government/other agencies likely to participate | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |

**DCCB has been selected as an SHPI and sanctioned grant for promoting 500 SHGs.*
*Source: Potential Linked Credit Plan 2007-08 (all districts), NABARD*

Self-help groups (SHGs) and micro-finance institutions are the main motivators and providers of micro-credit to people in the villages of the hill districts (Table 48). The presence of micro-finance institutions in remote areas is quite prominent but the SHG bank linkage program is still not progressing well in the region due to the conservative policy of the banking sector. Inter-governmental departments need to come together to create awareness among the people and to make the credit and banking sector work effectively in the hill regions. The informal credit delivery system plays an important role in reaching the rural people. It is through the collaboration of the nationalized banks, regional rural banks and SHGs that the linkages can be strengthened. The Small Industries Development Bank of India (SIDBI) is actively working in this field. Another institution is MIMO Finance, which is a four-year-old organization with 8,500 loan clients. Of these clients, 96 per cent are women. Except for 250 loan clients, the remainder are from Uttarakhand. It is a purely commercial finance organization and does not give any grants. MIMO believes that there can be a large market for financial services. It provides loans averaging Rs. 25,000 to joint liability groups, each having 5 members. All loans are made available to women who are not able to access banks, and are at the mercy of private money lenders. MIMO provides loans at the doorstep without any guarantee, and makes collections through easy weekly and monthly installments. Life insurance cover for all clients and their spouses is mandatory.

***SIDBI Case study***

*The Small Industries Development Bank of India (SIDBI) is in the process of providing assistance to hill areas. Assistance has been given to small units through NGOs. Ushamath Mahila Sanghadhaan is one of the NGOs which is working in the hills and plains. In Almora they have given assistance through grants as well as advances and now they are planning to give assistance to Chamoli. They provide assistance mainly for development purposes and do vigilance to check that the utilization of funds has been for development purposes. SIDBI does the monitoring once in six months. On an average they have extended long-term loans of about Rs. 50 lakhs at the rate of interest of 10.5 per cent for 4-5 years for Okhimat block (Rudrapraayag district). This microfinance helps weaker sections of society to run their self-employment units. In Almora District, they have 40 units under the Rural Industrialization Programme under which hills are linked to plains. The idea of SIDBI is self-employment generation through rural empowerment. These units also provide finished products to Fabindia. SIDBI has identified Micro Financing Institutes (MFIs) through which they are trying to establish small and cottage industries. It is also trying to concentrate on hotel and tourism for the plains and follows the model of MFIs to support cottage industries. MFIs are supported by Panchayats. They have not received any requests for BPO and no initiative has been taken yet because IT infrastructure is lacking. They say that telephone connectivity is very bad in the hills mainly during the rainy season. Appropriate funds are available with the department but have not been properly utilized. SIDBI has hired MCRI, a credit-rating agency. In the case of project finance, SIDBI takes care of certification from the Pollution Control Board. Once they get the certificate, they proceed with financing. There are no defaulters in micro-finance or project finance as of now. For employment generation, SIDBI is trying to help the Entrepreneur Development Programme (EDP).*

The Reserve Bank of India (RBI) has suggested measures to improve banking services in Uttarakhand. They recommend that the help of local agricultural universities, agribusiness centers, and Krishi Vigyan Kendras may be taken to improve the quality of input and output. Banks should also be made a party to negotiations with producers to settle the credit issue on the spot. These may act as single window clearances or tie-ups. Banks may also extend such facilities to the entrepreneurs, at least in their specialized SME branches. In order to facilitate borrowers in using the loans more profitably, banks should have a credit plus approach in their financial inclusion schemes. They would need to extend insurance, marketing, consultancy services, etc., as they can access technological developments taking place in agricultural universities, IITs, and research institutions. Considering the time, distance and cost for customers to reach a bank branch, especially in remote areas, banks can aggressively use the business facilitator model to increase their outreach. Banks may also identify well-respected local persons like school teachers, postmen, primary health workers or retired army officials. Certain banks have set up Rural Development and Self Employment Training Institutes (RUDSETI). Such measures have evoked a good response from borrowers and have enlarged the bank clientele. Major public sector banks in the state may consider setting up similar institutes in major cities.

Foreign tourists face difficulties exchanging foreign currency in banks and hotels in the state. There have also been problems making payments through national/international credit/debit cards by both domestic as well as foreign tourists. Given that the staff of banks, hotels, shops and emporia do not know how to handle foreign currency, the RBI and banks may organize seminars/workshops in matters related to foreign exchange at major centres in the state at regular intervals. In order to provide hassle-free cash withdrawal from banks to the tourists, major banks operating in the state may set up Automated Teller Machines (ATMs) at Tourist Information Centres and Wayside Amenities Centres for the convenience of tourists. Broadband connectivity will help banks establish ATMs at places of tourist interest and accept international debit/credit cards from foreign tourists. Bank branches dealing in foreign exchange may be provided with broadband connectivity immediately so that foreign tourists are extended hassle-free conversion facilities without any delay.

### 5.5 Literacy and Education

On social indicators, Uttarakhand fares quite well with a literacy rate of 71.6 per cent against the national figure of 64.8 per cent. Some hill districts have a literacy rate above the state average. As expected the literacy rate for females is lower than that for males; more than 80 percent of the males are literate and the female literacy rate varies across districts. However, the unexpected part is that these numbers are much higher than the national average. This can be considered a unique feature of the state and is also the reason behind the rapid growth of this state (Table 49).

**Table 49 : Literacy Rate (in per cent), 2001**

| Districts | Total | Male | Female |
|---|---|---|---|
| Almora | 74.0 | 89.0 | 61.0 |
| Bageshwar | 71.3 | 87.7 | 57.0 |
| Chamoli | 75.4 | 89.7 | 61.6 |
| Champawat | 70.4 | 87.3 | 54.2 |
| Pauri Garhwal | 77.5 | 90.9 | 65.7 |
| Pithoragarh | 76.0 | 90.1 | 62.6 |
| Rudraprayag | 73.7 | 89.8 | 59.6 |
| Tehri Garhwal | 66.7 | 85.3 | 49.4 |
| Uttarkashi | 65.7 | 83.6 | 46.7 |
| Dehradun | 79.0 | 85.9 | 71.2 |
| Haridwar | 63.8 | 73.8 | 52.1 |
| Nainital | 78.4 | 86.3 | 69.6 |
| US Nagar | 64.9 | 75.2 | 53.4 |
| **Uttarakhand** | **71.6** | **83.3** | **59.6** |
| India | 64.8 | 75.3 | 53.7 |

In terms of basic education, the number of schools/colleges in the state in 2003-04 was 19,700 which accounted for 1.7 per cent of the national figure. Figures for 2001-02 show that there were 1,946,343 students in the state compared to 194,946,000 in India, i.e., around 1 per cent (Table 50). The number of students in the hills is 53.5 per cent of the state total, whereas students in the plains make up 46.5 per cent.

**Table 50 : Number of schools and students in Basic Education**

*(Unit: No.)*

| Basic/ Secondary Education | Uttarakhand | India |
|---|---|---|
| No. of schools/ colleges (2003-04) | 19700 | 1183674 |
| No. of students (2001-02) | 1946343 | 194946000 |

*Source: Central Statistical Organization.*

At the district level, the school infrastructure is not bad; it is the availability of teachers and the teacher-student ratio that creates doubts about the quality of education (Table 51). The literacy rate is high because the people of Uttarakhand are interested in getting jobs, but the quality of skills imparted is doubtful because it does not actually help them get good jobs. To create jobs in the industrial sector, ITIs have been set up in the state and even hill districts, but the students do not find work in the local job market either due to scare jobs or their low skills. Thus they migrate to other states.

**Table 51 : Status of Education in districts of Uttarakhand, 2006**

| District | Primary schools | Primary students enrolled | Primary school teachers | Primary students per teacher | Secondary schools | Secondary students enrolled |
|---|---|---|---|---|---|---|
| | *No.* | *No. (in 1000s)* | *No.* | *No.* | *No.* | *No. (in 1000s)* |
| Almora | 1917 | 174 | 4407 | 39 | 87 | 71 |
| Bageshwar | 776 | 55 | 1847 | 30 | 29 | 25 |
| Chamoli | 1374 | 80 | 2998 | 27 | 79 | 23 |
| Champawat | 663 | 50 | 1449 | 35 | 34 | 18 |
| Pauri Garhwal | 2366 | 105 | 5160 | 20 | 107 | 70 |
| Pithoragarh | 1578 | 108 | 3183 | 34 | 57 | 45 |
| Rudraprayag | 826 | 44 | 1557 | 29 | 40 | 30 |
| Tehri Garhwal | 1957 | 141 | 4212 | 33 | 66 | 60 |
| Uttarkashi | 1098 | 80 | 2135 | 37 | 39 | 31 |
| Dehradun | 1986 | 150 | 3208 | 47 | 62 | 130 |
| Haridwar | 1467 | 276 | 2245 | 123 | 43 | 69 |
| Nainital | 1510 | 155 | 3866 | 40 | 68 | 51 |
| US Nagar | 1396 | 247 | 3298 | 75 | 62 | 88 |

The industrial requirements for a skilled work force are far higher than the availability due not only to the shortage of ITIs in the state but also, more importantly, due to the quality and orientation of education and training imparted at these institutes which does not fit job requirements at the factories. It is estimated that around 70 percent of the ITI-trained local persons do not get employment in the industries, whereas outside candidates are given employment opportunities. Vocational courses should be encouraged to meet the shortage of skilled labour and the government should take steps to tackle this problem. The Navodya Vidyalayas provide a good model of how to provide high-quality education to talented students who cannot afford it.

Thus there is need for training that includes industry-specific training; for example, there are different requirements for the paper industry and the pharmaceutical industry, so the same training may not be applicable at both places. Given this scenario the state unit of the CII has suggested that the state government privatize five ITIs to impart industry-oriented training that matches industry requirements. These training institutes should tie up with industry. Creating education centers would lead to development in a radius area around it. High-level vocational training is required for which polytechnics should be set up; they could train students for the hotel and construction industries. Course development is also required in every block of the state but it should be customized and not standardized. Since soft skills are very important, 10-20 per cent of training time should be spent on developing these skills.

## 6. Development Strategy and Sectoral Perspective

Uttarakhand, in spite of being a small state, has certain key features that make it distinct from other states of the country and highlights its potential for development. Uttarakhand is the first state in the country to have created a Tourism Development

Board by legislation. It is also the first state to propagate organic farming on a wide scale. However, the development has predominantly been in the plains and the hill districts have been left behind. All the hill districts have farming and crop husbandry as their main economic activities, along with dairy and poultry farming to diversify their source of earnings. But these are only subsistence activities that have led to migration and a remittance economy in the hill districts. Thus, the hill districts have a demographic bias towards women who are not skilled in earning money. In addition, female literacy is only 57%. Overall, the hill districts are characterized by low productivity, shortage of inputs, and lack of marketing that have confined the villages to producing only for self-consumption. These regions are land-locked with huge distances between the markets and resources. Because of these constraints, traditional agriculture cannot be the lead sector for development. The positive features of these hill districts are that they have huge tourism potential, a suitable climate for high-value agriculture, and a pleasant environment due to 60 per cent forest cover. These have to be harnessed to create a development strategy.

The development strategy for the Uttarakhand hills should be based on developing brand equity under the name of **Organic Green State.** An **Uttarakhand Brand Equity Fund** should be developed in line with IBEF (Appendix 10). This can be achieved through:

- Developing infrastructure
- Propagating tourism
- Diversifying agriculture
- Promoting poultry- and wool-based livelihoods
- Establishing SMEs based on the above
- Capturing linkages with industry and tourism

Although some hill districts are rich in mineral resources, mining should not be promoted. Modern mining which is highly mechanized will not create significant additional employment. Further, mining can be a threat to ecology, disturbs the natural environment and affects agriculture. This would discourage tourism and works against the state's brand equity of **Organic Green State**.

### 6.1 Agriculture Diversification and Development of Allied Sectors

Since the hill regions are very different in their ecosystem from the plains, it is essential to use a different approach to agriculture in the hill districts of Uttarakhand. The green revolution of the 1960s benefited only those areas that had irrigation facilities, but this was not possible in the hills, which lacked this resource. Thus the recommendations for development of the hill districts based on agriculture diversification are as follows:

1. Promote agriculture that is based on high-value herbal, medicinal and aromatic plantation. Since markets are a problem, links with retailers and ayurvedic firms should be propagated. A memorandum of understanding should be signed with retailers and firms backed by legislation in order to prevent exploitation of farmers; this will help in evolving rules for fair transactions. This should be in

coordination with the Herbal Research and Development Institute (HRDI) to help farmers in selecting village-specific commodities.

2. Alternative areas of diversification are towards horticulture crops, spices and condiments (chilies, ginger, and garlic), tea plantation, floriculture, oilseeds (sesamum, rapeseed & mustard and soybean) and traditional hill grains (mandua, bhatt, sanwa, urad, gahat). Intercropping of aromatic plants with conventional grains can also help in diversifying the income basket of small and marginal farmers.

3. If these commodities are grown organically they can increase incomes in the hill regions because discerning buyers prefer and are willing to pay more for organic goods. Organic farming methods are the preferred option for the agriculture-based hill region. It is necessary to promote the Organic Uttarakhand brand in order to secure the interests of the small organic agriculturalists of the state and develop the brand image of the state.

4. A cluster approach should be adopted in the hill regions. The cluster approach includes the provision of extension services, financial services, inputs, production process and facilitation of processing. This will help reduce the cost of production, improve yields and generate marketable surpluses. Performance-based credits and subsidy policies can incentivise small and marginal farmers to adopt the best practices.

5. Develop mandis and create linkages between producers and buyers; even contract farming can be promoted, but under a suitable legislative framework. Mandis have to be created for the sale of good quality produce at reasonable prices. For unique biodiversity products, separate markets should be developed in the hills. Low-cost collection centers and facilities should be created and then aligned with the terminal market in Chandigarh. In the long run, a terminal market can be created specifically for Uttarakhand.

6. Rural infrastructure development should be in line with the focus on diversification that is suggested above.

7. Animal husbandry and forest resource use are a part of hill livelihood; these need to be developed on a commercial basis. Measures should be taken to improve the genetic stock of sheep and goats. There is a need to rejuvenate the government's agriculture extension and veterinary systems.

8. Forest and land development. Forest trees offer an alternative source of livelihood. The state should connect with agencies in other countries like Israel and China for expertise on the development of semi-arid land. Research firms should be contacted for commercialization of jatropha for bio-diesel. Land Army- Doon Valley model should be spread to other districts. 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, inputs, etc. can be adopted by organizations and clusters and diverted towards high-value cultivation.

9. The active involvement of people in conserving and managing the forests can result in high biodiversity as well as meet their bio-mass requirements. Carbon Trading (Appendix 12) should be encouraged and Carbon Credit facility should be given for environment conservation/maintenance. This should be done through the Planning Commission or by the state government.

### 6.2 Development of Small and Medium Enterprises (SMEs)

The Integrated Industrial Development Policy 2008 was launched in February 2008 especially for the industrial development of hilly and remote areas in the state. Under this policy, small-scale agro-based industries and cottage industries should be promoted for the development of the hills.

1. Encourage agro-processing SMEs. Industrial activity in the hill regions can be tapped from local agro-based industries (e.g. herbs, fruits, frozen tulsi, fruit juices, and jams) and handicraft/ cottage industries (e.g. shawls, woolens, and hosiery). To improve the output, the latest technology and easy accessibility of raw materials should be provided

2. To facilitate the development of these SMEs, the land acquisition process should be handled with sensitivity, stable power supply should be provided by the government, and single-window clearance and licenses should be made available within three days. The findings of the World Bank survey, "Doing Business" should be fully implemented.

3. Create a task force for vocational training and skill upgrading with the active participation of local industries. Upgrade the ITIs and revise their curriculum to suit local needs.

4. For the development of business skills in people, the development of entrepreneurial skills is crucial. Creating awareness and training can also help develop entrepreneurial skills. Since in the hill regions it is equally important to develop the entrepreneurial skills of women, vocational training should be imparted in activities like dairy processing, poultry raising, papad-making, mushroom cultivation, bee-keeping, quilt-making and running a small business.

5. Link up with CDRI, Lucknow for research and development in pharmaceuticals, aromatic cosmetic industries, etc. This will help add value to agri-products. Seed testing laboratories, organic certification centers, etc. should be developed in the hills.

### 6.3 Promoting Tourism

Tourism should be given the highest priority because it can be the biggest source of employment and it also creates linkages for local area development. Tourism should be given the status of an industry. The Uttarakhand Tourism Development Master Plan for 2007-22 has already been developed with the coordination of the Government of India, Government of Uttarakhand, United Nations Development Programme (UNDP) and World Tourism Organization.

1. The state attracts tourists for pilgrimages, cultural tourism, nature tourism, adventure tourism, wildlife tourism, eco-tourism, and amusement and leisure tourism. It is crucial to identify the seasonality of different kinds of tourism. Tourists should be attracted taking this into account so as to create round-the-year tourism-based employability.

2. Tourism should be developed in an environment-friendly manner so as to harmonize with the effective branding of the state as an **Organic Green State.** The objective should be to nurture the existing beauty rather than to create modern tourist destinations.

3. Uncontrolled and unplanned tourism is not healthy. Thus tourist zones have to be connected by formal and informal links in the form of roads, trails and tracks and thematic circuits. A strong regulatory framework that oversees quality of service is necessary. Implementation of rules and security should be given utmost priority.

4. Proper publicity and marketing is required along with the development of skills and the associated service sector to provide world-class service. There is lack of awareness of Uttarakhand as a tourism destination because of ineffective branding of the state, the lack of marketing strategies and unfocussed annual campaigns. For tourism development, there should be a tie-up with major tour operators like Thomas Cook and Carlson Wagonlit Travel. To develop hotels in all categories, there needs to be a tie-up with national and international hotel groups.

5. The bed-and-breakfast model should also be propagated for low-budget domestic travelers.

6. Investments in hotels and inns can be promoted/ facilitated if the investor is granted a long-term lease. In selected cases, a collaborative partnership between the local land-owner and investor can also be implemented.

### 6.4 Developing Infrastructure

The major infrastructure issues are drinking water and irrigation facilities, electricity, road and communication facilities, banking infrastructure, and social infrastructure like housing and education. For all infrastructure development projects it is important for targets to be specified.

1. The issue of drinking water supply must be part of an integrated water resource management plan, which in turn is part of an integrated natural resource management based on a watershed development approach. Lift irrigation techniques, such as hydrams and guhls can be used to improve irrigation in Uttarakhand, particularly in the hill districts.

2. Gharats in Uttarakhand, have traditionally been used to mill grain and extract oil. The contribution of institutions like HESCO[25] (Himalayan Environmental Studies

[25] HESCO got the CNN-IBN 'Real Heroes Award' 2007 for their contribution to rural development.

and Conservation Organization) to promote the use of water mills in generating hydropower is significant, and such efforts should be encouraged.

3. The availability of cheap power by way of inexpensive water-lifting systems for irrigation will boost agriculture. Alternative energy sources like solar energy should be encouraged.

4. Road networks should be further developed. In addition to roads in smaller villages, a simple and cost-effective trolley system should be introduced. Road connections and maintenance should be given priority and important destinations in each district should be linked. The responsibility should be assigned to an agency at a decentralized level.

5. The ideal approach involves large-scale community participation which makes the installation as well as running of the micro-plant economical. Panchayati Raj institutions must play an active role regarding control and management of water, land, forest resources and maintenance of the roads.

6. The banking sector offers a low credit deposit ratio (CDR) that is only 25 % in hill districts as against 45% in the rest of the state. Only the State Bank of India (SBI) is active in the hill regions where it is trying to achieve the objective of 100 per cent financial inclusion. To achieve the stated objective of financial inclusion, the RBI should be approached to impose a Universal Service Obligation on all commercial banks that will facilitate the faster spread of rural/ hill area banking,

7. People in the hill regions should be made aware that loan schemes are available, e.g., SIDBI's credit guarantee scheme. The setting up of self-help groups and micro-finance institutions as motivators and providers of micro-credit should be facilitated.

8. Special emphasis on female education is needed. For the school education system it is important to meet the shortfall in teachers and quality educational institution. Thus, measures are needed like removing institutional licensing, drawing up a plan for teacher training, raising teacher's salaries (in other words, immediately implementing the recommendations of the 6th Pay Commission), and giving additional incentives to teachers in hill regions.

### 6.5 Development Strategy for Hill Districts

Infrastructure development is a common development agenda to facilitate development in the hill districts. In addition, specific issues pertaining to each hill district are identified and listed below. The listing is based on the areas that should be given priority

Organic farming methods are recommended for all in order to create the brand equity of **Organic Green State.**

| Hill Districts | Development Plan |
|---|---|
| **Almora** | • Diversify agricultural products to include fruits (apples), spices (ginger), and herbal/medicinal plants<br>• Develop minor irrigation projects to facilitate agricultural diversification<br>• SSIs based on wool<br>• Impart training in design in the handloom sector<br>• Develop leisure and nature tourism. For example, areas such as Ranikhet and Kausani have not been explored. |
| **Bageshwar** | • Diversify agricultural products to include off-season vegetables and fruits (peas, cabbage, beans, tomato and potato). The traditional crop, bhatt, is important. Promote plantation of tea, chillies, turmeric and other herbal plants.<br>• Fodder and grazing land is an asset that can be used to meet demand from neighboring districts.<br>• SSIs and agro-based industries for jams and pickles. Khadia in cosmetic products.<br>• Promote leisure and nature tourism. |
| **Chamoli** | • Religious tourism to the Valley of the Flowers, Hemkunt Sahib, Badrinath, and Kedarnath. Other types of tourism to Nanda Devi National Park, river rafting, and rock climbing.<br>• Poultry and wool-based industry<br>• Agriculture diversification towards herbal and medicinal plants, pulses, and off-season vegetables<br>• Develop forest resources: Jatropha plantation for bio-fuel, bimal trees for the cosmetics industry, and forest-based handicrafts |
| **Champawat** | • Diversify agricultural products to include medicinal and aromatic plants, ginger and other spices, and organic fruits and vegetables<br>• Forest products: Ringal-based products by local artists |
| **Pauri Garhwal** | • Poultry and wool-based development: Sheep<br>• Diversify agricultural products to include herbal and medicinal plants, pulses, bee-keeping and mushroom cultivation<br>• SSIs and agro-based industries: Bamboo and fiber development, and jatropha-based bio-diesel.<br>• Start a medicinal plant-based pharmaceutical industry<br>• Bimal and rambans fiber for handicrafts and furniture |

| Hill Districts | Development Plan |
|---|---|
| **Pithoragarh** | • Poultry and wool-based development: Goat-rearing<br>• Diversify agricultural products to include litchi, herbal and medicinal plants, garlic and spices.<br>• SSIs and agro-based industries- Bamboo, ringal and fiber development, and furniture production from forest products |
| **Rudraprayag** | • Religious tourism to Kedarnath; adventure tourism like river rafting, rock climbing<br>• Diversify agricultural products to include herbal and medicinal plants, haldi and coriander.<br>• SSIs and agro-based industries: Bio-fuel, bamboo plantation, and traditionally-grown mandua for bakery products<br>• Forest-based industry |
| **Tehri Garhwal** | • This district is rich in irrigation facilities; thus, agricultural diversification towards fruits and vegetables, spices, pulses, herbal and aromatic plants using a cluster approach combined with proper market development can be very successful.<br>• SSIs and agro-based industries: Food-processing industry, forest-based industry, fruit- and vegetable-processing industry.<br>• Training and innovation to add value to small enterprises.<br>• Nature tourism and adventure tourism in Devprayag. |
| **Uttarkashi** | • Religious tourism to Gangotri, Yumunotri, etc.<br>• Diversify agricultural products to include fruits and vegetables, apple orchards, tea plantations, and aromatic plants<br>• Development of sheep- and goat-rearing, and wool-based industry<br>• Nature and leisure tourism |

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**Appendix 1 : Development Blocks in Various Districts of Uttarakhand**

| **Almora** | **Bageshwar** | **Champawat** | **Chamoli** |
|---|---|---|---|
| Syalde | Kapkot | Pati | Joshimath |
| Chaukhutiya | Bageshwar | Baurakot | Karnaprayag |
| Bhikiasen | Garud (Baijnath) | Lohaghat | Dasholi |
| Tadikhet | | Champawat | Ghat |
| Salt | | | Narain Bagad |
| Dwarahaat | | | Gairsain |
| Takula | | | Tharali |
| Bhaisiyachhana | | | Devaal |
| Hawalbagh | | | Pokhari |
| Lamgada | | | |
| Dhauladevi | | | |

| **Pauri** | **Pithoragarh** | **Rudraprayag** | **Tehri** | **Uttarkashi** |
|---|---|---|---|---|
| Kot | Munsyari | Ukhimath | Pratap Nagar | Mori |
| Kaljikhal | Dharchula | Agustmuni | Bhilangana | Purola |
| Pauri | Berinaag | Jakholi | Jakhnidhar | Naugaon |
| Pabo | Didihaat | | Jaunpur | Dunda |
| Thaisain | Kanalichheena | | Thauladhar | Chinyalisaud |
| Bironkhal | Gangolihaat | | Chamba | Bhatwadi |
| Dwarikhal | Pithoragarh | | Narendranagar | |
| Dugadda | Moonakot | | Devprayag | |
| Jaharikhal | | | Kirti Nagar | |
| Ekeshwar | | | | |
| Rikhnikhal | | | | |
| Yamkeshwar | | | | |
| Nainidanda | | | | |
| Pokhda | | | | |
| Khirsu | | | | |

**Appendix 2: District wise demographic indicators, 2001**

| Districts | Total Population | Male | Female | Population Growth Rate | Population Density | Sex Ratio | Crude Birth Rate* | Infant Mortality Rate* | Literacy Rate Total | Male | Female |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Almora** | 630567 | 293848 | 336719 | 3.14 | 171 | 1,146 | 30 | 40 | 73.64 | 89.2 | 60.56 |
| **Bageshwar** | 249462 | 118510 | 130952 | 17.56 | 148 | 1105 | 32.6 | 65 | 71.29 | 87.65 | 56.98 |
| **Chamoli** | 370359 | 183745 | 186614 | 13.51 | 49 | 1016 | | | 75.43 | 89.66 | 61.63 |
| **Champawat** | 224542 | 111084 | 113458 | 9.21 | 115 | 1021 | | | 70.39 | 87.27 | 54.18 |
| **Pauri Garhwal** | 697078 | 331061 | 366017 | 3.87 | 133 | 1106 | 27.4 | 69 | 77.49 | 90.91 | 65.7 |
| **Pithoragarh** | 462289 | 227615 | 234674 | 10.92 | 64 | 1031 | 30.7 | 76 | 75.95 | 90.06 | 62.59 |
| **Rudraprayag** | 227439 | 107535 | 119904 | 13.44 | 93 | 1115 | | | 73.65 | 89.81 | 59.57 |
| **Tehri Garhwal** | 604747 | 295168 | 309579 | 16.15 | 159 | 1,049 | 32 | 69 | 66.73 | 85.33 | 49.42 |
| **Uttarkashi** | 295013 | 152016 | 142997 | 22.72 | 37 | 941 | 32.8 | 98 | 65.71 | 83.6 | 46.69 |

*Note: * Data pertains to the year 2000*
*Total Population in lakhs.*
*Source: National Population Policy, GOI 2000 and Census of India, 2001*

**Appendix 3 : Holdings and Areas under Different Operational Holding Sizes, 2001**

| Hill districts | Number | | | | Area (in hectares) | | | |
|---|---|---|---|---|---|---|---|---|
| | Marginal holdings (<1.0 Ha) | Small holdings (1.0 - 2.0 Ha) | Medium & large holdings (> 2.0 Ha) | All size groups | Marginal holdings | Small holdings | Medium & large holdings | All size groups |
| Almora | 94260 | 21796 | 6231 | 122287 | 44503 | 29251 | 16978 | 90732 |
| Bageshwar | 49786 | 4670 | 831 | 55287 | 19553 | 6193 | 2265 | 28011 |
| Chamoli | 26262 | 7595 | 4666 | 38523 | 9390 | 10874 | 15563 | 35827 |
| Champawat | 26765 | 6430 | 2475 | 35670 | 12576 | 8936 | 7348 | 28860 |
| Pauri Garhwal | 43590 | 24389 | 18286 | 86265 | 21024 | 34703 | 59648 | 115375 |
| Pithoragarh | 75127 | 9652 | 2047 | 86826 | 35236 | 12926 | 5596 | 53758 |
| Rudraprayag | 25273 | 4718 | 1517 | 31508 | 9702 | 6589 | 4495 | 20786 |
| Tehri Garhwal | 55774 | 17895 | 7075 | 80744 | 23280 | 24631 | 21019 | 68930 |
| Uttarkashi | 24516 | 6288 | 5505 | 36309 | 7372 | 9356 | 17923 | 34651 |
| Dehradun | 50267 | 8409 | 6988 | 65664 | 18604 | 11943 | 28040 | 58587 |
| Haridwar | 78525 | 20945 | 16586 | 116056 | 32417 | 28480 | 58374 | 119271 |
| Nainital | 32666 | 8349 | 8793 | 49808 | 11573 | 12068 | 33473 | 57114 |
| US Nagar | 43787 | 17014 | 22522 | 83323 | 21978 | 24383 | 93975 | 140336 |

## Appendix 4 : Forest Rules and Regulations

### Van Panchayats

The state of Uttarakhand is blessed with good forest wealth. Out of the total geographical area, the forest area is around 61.1 percent. These forest lands in the state are managed by different agencies, viz., the Forest Department, Revenue Department, Van Panchayats, private forests, Municipal & Cantonment Forests, and others[26].

Van Panchayats are unique to Uttarakhand. The history of Van Panchayats goes back to the 1910s when the British Government launched a program of forest management in which the local people were debarred from using forest resources. Consequently, there was much resentment amongst the local people and in 1921 the British government was forced to constitute a Forest Grievance Committee. As a result of the deliberations of this committee, in 1931 the British government agreed to return the forests around the villages to people for utilisation and management. Thus, the concept of Van Panchayat was born. In 2001, after the formation of the state of Uttarakhand, the Van Panchayat Rules were further amended to provide a greater role to the Forest Department in the functioning of the Van Panchayats.

The main functions of Van Panchayats are as follows:

- To develop and protect forests by preventing indiscriminate felling of trees and to fell only those trees that are marked by the forest department and are useful for silviculture.
- To ensure that there is no encroachment on Van Panchayati land and no violation of rules under the Kumaon and Sodic Land Act of 1948 and that no land is encroached on for agricultural practices without prior permission.
- To construct and fix boundary pillars and to maintain them.
- To carry out the directives of the Sub-Divisional Magistrate in developing and protecting forests.
- To distribute its produce amongst right holders in an equitable manner. 20 per cent of the area of the forest must be closed for grazing every year.

There are 12,067 Van Panchayats in Uttarakhand formed under the Joint Forest Management or other programmes by the State Forest department. These Van Panchayats/ Forest protection committees look after an approximate area of 5.22 lakh ha of forest area in the state. The Van Panchayats manage forest lands under their control and members are entitled to usufructuary rights; earlier, landless villagers had also been given the rights of users. The Forest Department provides necessary technical help in the management of panchayati forests. The share of forest panchayat income is about 80 per cent of the total produce. So far, 5.45 lakh ha land has been brought under Van Panchayats for which an amount of Rs. 732.04 lakh has been created as part of the Van Panchayat Fund. The total funds available for each Van Panchayat works out to Rs. 6,065.45 or Rs. 13.43 per ha which appears to be highly

[26] State Focus Paper, 2007-08, NABARD.

inadequate. It is, therefore, necessary to set up an appropriate plan to revamp the Van Panchayats in order to sustain them.

Despite being an excellent example of state-people partnership, which has been relatively successful in managing forest resources in the region, the institutions are facing challenges from unrealistic and target-driven policies that affect their democratic functioning. There is a need to replicate such institutions in other areas rather than interfering with the existing ones. Moreover, Non-Governmental Organizations need to play a more active role in keeping these institutions alive by bringing the communities to the centre stage of decision-making.

**Joint Forest Management (JFM) Programme** JFM is a concept of developing partnerships between fringe forest-user groups and the Forest Department on the basis of mutual trust and jointly-defined roles and responsibilities with regard to forest protection and development. The basic concept is to develop forests with the participation of the people. JFM is slowly emerging as a form of sustainable forestry, which augments the forestry regime with processes for rapid adaptation to changes in what people need, want and can do. While the primary objective of the JFM programme continues to be rehabilitation of degraded forestlands with people's organizations and Forest Protection Committees (FPCs), in the course of its evolution approaches like village resource development, micro-watershed development, water and soil conservation, and rural infrastructure development have become integrated into JFM; this is because the government is attempting to improve the socio-economic status of forest-dependent communities in order to reduce the pressure on forests. JFM in Uttarakhand is governed by the UP Village Forests Joint Management Rules, 1997 that apply to village forests in the state not governed by the UP Panchayati Forest Rules, 1976 (now amended to the Uttarakhand Panchayat Forest Rules, 2001). Uttarakhand ranks second to Madhya Pradesh in the whole of India in the number of villages which have taken up joint forest management.

**Forest Council Act**

The Forest Council Act prescribes how panchayats (councils) can be formed and imposes duties on village panchayats. The objective is to protect forest areas and ensure that forest products are distributed among the right holders in an equitable manner. The Kumaon Panchayat Forest Rules enacted under Section 28 (2) of the Indian Forest Act of 1927 provides broad guidelines for the supervision and management of forests under the control of Van Panchayats. These Forest Council rules lay down the broad parameters of management practices to be followed by the Van Panchayats.

**Forest (Conservation) Act, 1980** with Amendments Made in 1988: It is an Act to provide for the conservation of forests and for matters connected therewith or ancillary or incidental thereto. Restriction on the de-reservation of forests or use of forest land for non-forest purpose. Non-forest purpose means the breaking up or clearing of any forest land or portion thereof for the cultivation of tea, coffee, spices, rubber, palms, oil-bearing plants, horticultural crops or medicinal plants; any purpose other than re-afforestation; but does not include any work relating or ancillary to conservation, development and management of forests and wildlife, namely, the establishment of check-posts, fire lines, wireless communications and construction of fencing, bridges and culverts, dams.

## Appendix 5 : Tehri Dam Project

Tehri dam is the main dam of the Tehri Hydro Project, a major power project located near Tehri in the state of Uttarakhand in India. It is a multipurpose river valley project. Towering 855 feet (261 m) high, the main dam at Tehri is the 8th tallest dam in the world. The dam's projected capabilities include a power generation capacity of 2400 MW, irrigation stabilization to an area of 6,000 km², an additional area of 2,700 km² of irrigation stabilization and a supply of 270 million gallons (1.23 million cubic metres) of drinking water to industrialized cities in Delhi, Uttar Pradesh and Uttarakhand. The dam is being constructed at the confluence of the Bhagirathi and Bhilangana, close to the Garhwal town of Tehri. The lake created by the dam will extend upto 45 kms in the Bhagirathi Valley and 25 kms in the Bhilangana Valley with a water-spread area of 42.5 sq. kms. As a result, nearly 100 villages, including Tehri a historical capital, will be submerged and as many as 85,600 families relocated.

The Tehri dam project has provoked controversy focused on three issues. The completed dam will displace many people and submerge several towns, among them the town of Tehri. The region is vulnerable to earthquakes and the dam may be structurally incapable of withstanding them or may even cause them. The possible destruction of the dam could kill hundreds of thousands of people and destroy downstream towns of immense religious significance; of particular concern are the 170,000 inhabitants of the downstream Hindu holy towns of Hardwar and Rishikesh. Both the resettlement policies and the structural flaws of the dam have provoked civil protests, lawsuits and international attention that have repeatedly stalled the project, which was begun in 1978. The principal finding of the multi-disciplinary team that conducted the appraisal was that the benefit to cost ratio of the Tehri dam, after calculating social and environmental costs and benefits, works out to 0.56:1, well short of the 1.5:1 ratio adopted by the Planning Commission to sanction such projects. The Supreme Court dismissed the petition in 1990 after a limited enquiry. Although the Environmental Appraisal Committee had unanimously concluded that the Tehri project should not be approved, the Central Government relied instead on the opinion of the Department of Mines to convince itself and the court that the project was sound.

## Appendix 6 : Existing Master Plans for Tourism Development

1) Tourism Master Plan for Pithoragarh - Munsyari Circuit, March 2005.
2) Master Plan for Trekking Routes in Uttarakhand, January 2003
3) Master Plan for Dayra Bugyal, 2002
4) Master Plan for Eco-Tourism in the Valley of the Flowers – Hemkund Belt, 2005
5) Master Plan for Pauri, Khirsu and Lansdowne, 2003
6) Master Plan for Development of Eco-Tourism Destination at Hempur, 2003
7) Tourism Master Plan for Tehri Dam Project Area, 2002
8) Master Plan for development of Aviation Infrastructure in Uttarakhand
9) Concept Plan for Development of land around three local airstrips

**Appendix 7 : Major Places and Tourist Arrivals in Districts of Uttarakhand, 2005-06**

| Places | Domestic (no.) | Foreign (no.) | Total (no.) | Details |
|---|---|---|---|---|
| Almora | 79435 | 4921 | 84356 | main city |
| Auli | 10525 | 456 | 10981 | ice games, skating |
| Badrinath | 566224 | | 566224 | religious |
| Bageshwar | | | | city |
| Champawat | 44623 | 128 | 44751 | city |
| Dehra Dun | 1013959 | 12012 | 1025971 | city |
| Gangotri | 222834 | 227 | 223061 | religious |
| Gopeswar | 198785 | 313 | 199098 | city |
| Haridwar | 7527020 | 13624 | 7540644 | religious & city |
| Hemkund Saheb | 548389 | 25 | 548414 | religious |
| Joshimath | 934242 | 1410 | 935652 | city |
| Kathgodam | 46914 | 240 | 47154 | gateway to Kumaon hills, last rail station to hills |
| Kausani | 66335 | 419 | 66754 | famous tourist spot |
| Kedarnath | 378162 | 4811 | 382973 | religious |
| Kotdwara | 251563 | 14677 | 266240 | city |
| Mussoorie | 1044245 | 3547 | 1047792 | paharon ki rani, tourist place |
| Nainital | 510959 | 6789 | 517748 | tourist place |
| National Corbett Park | 114623 | 8199 | 122822 | wild-life sanctuary |
| Pauri | 80303 | 38 | 80341 | city - tourist |
| Pithoragarh | 160311 | 989 | 161300 | city - tourist |
| Punyagiri | | | | religious |
| Ranikhet | 75165 | 867 | 76032 | tourist place |
| Rishikesh | 369573 | 5538 | 375111 | religious & tourist city |
| Rudraprayag | 439719 | 1289 | 441008 | city |
| Srinagar | 188051 | 423 | 188474 | city |
| Tehri | 676223 | 9843 | 686066 | city |
| Udhamsingh Nagar | 69030 | 205 | 69235 | city |
| Uttarkashi | 489990 | 1060 | 491050 | city |
| Valley of the Flowers | 4664 | 547 | 5211 | tourist place |
| Yamunotri | 168899 | 147 | 169046 | religious |
| **Total** | **16280765** | **92744** | **16373509** | |

*Source*: Monthly Review of Uttaranchal Economy, Centre for Monitoring Indian Economy, Oct-Nov-Dec 2006 issue (p. 40).
*Note*: Data for the months of April to December of 2005-06.

## Appendix 8 : Panchayati Raj Institutions and Uttarakhand

Panchayati Raj Institutions – the grass-roots units of self-government – have proven to be an instrument of socio-economic transformation in rural India. Effective and meaningful functioning of these bodies depends on active involvement, contribution and participation of its citizens. Mahatma Gandhi advocated Panchayati Raj, a decentralized form of government where each village is responsible for its own affairs, as the foundation of India's political system. His term for such a vision was "Gram Swaraj" (Village Self-governance).

Decentralized development and peoples' empowerment would help the local people of the state of Uttarakhand to achieve positive socio-economic conditions such as removal of regional economic backwardness, poverty and unemployment. There is strong evidence in the case of Kerala where bold and historic initiatives taken by the state government have brought about high literacy rates, sharp reduction in deprivation and absolute poverty, better medical and health facilities, successful land reforms, mass organizations to strengthen the case for local democracy, and better redistributive policies of the government for social sector planning including social provisioning of education, health, economic assets, improved working conditions, and bargaining power of the labor force. The state of Kerala has a good record of literacy and educational levels and today ranks among the top ten Indian states in terms of higher literacy rates. Apart from the abundance of natural resources and a well-educated human resource base, a rich cultural and social heritage can enormously contribute to the success of participatory governance in a state. Traditional village panchayats and Van Panchayats have performed well in bringing social welfare and delivering justice to the people. Under the decentralized system of development, the government will have to transfer common property rights of the land to local self-governments. In fact, most of the land under government control including reserve forests needs to be transferred to the village and urban local self-governments to be managed, protected and developed by them without any bureaucratic interference.

The full participation of the people and their empowerment will ensure the dual objectives of creating employment opportunities and a swift increase in production, asset creation, and value addition. After the initiation of the people's campaign for decentralized development in 1996, Kerala is demonstrating a unique and successful model of decentralized planning for social development to the world in our own country.

If such model is adopted for Uttarakhand, it would not only ensure collective property rights over the people's natural resources but also bring in economic prosperity and social harmony.

**Appendix 9 : Infrastructure Support in Districts of Uttarakhand**

| Infrastructure component | Uttarakhand | Almora | Bageshwar | Chamoli | Champawat | Pauri Garhwal | Pithora garh | Rudraprayag | Tehri Garhwal | Uttarkashi |
|---|---|---|---|---|---|---|---|---|---|---|
| **Electricity** | | | | | | | | | | |
| Percentage of villages electrified | 86.91 | 81.83 (A) | 80 (A) | 87.82 (A+) | 73 (B) | 75.99 (A) | 86.7 (A) | 84 (A) | 80 (A) | 97.88 (A) |
| **Transportation** | | | | | | | | | | |
| Road density (*total length of surfaced roads in km)* per 1000 sq. km. | 478.06 | 509 km (A+) | 291 km (C) | 144.28 (D) | 329.9 (C) | 649.52 (A+) | 185.17 (D) | 312.42 (C) | 480.51 (A) | 153.32 (D) |
| No. of transport vehicles (registered vehicles of all types) per 1000 sq. km. | 18,753.67 | NA (--) | NA (--) | 9,348 (D) | 2,046 (D) | NA (--) | 730 (D) | NA (--) | NA | NA |
| Villages connected by pucca roads (per cent) | 63.75 | 47 (B) | 69 (A+) | 65.18 (A+) | 38 (C) | 66.91 (A+) | 44.52 (B) | 71.51 (A+) | 71.74 (B) | 52.34 (B) |
| **Irrigation** | | | | | | | | | | |
| Irrigated area to net cropped area (per cent) | 43.72 | 8 (D) | 23.31 (C) | 6.13 (D) | 8.8 (D) | 8.51 (D) | 19.64 (B) | 12.67 (D) | 13 (D) | 20.15 (D) |
| Area irrigated through groundwater | 58.20 | 0.00 (D) | 0.00 (D) | NA (--) | 0.00 (D) | 6.05 (D) | NA (--) | NA (--) | 17.53 (D) | 0 (D) |
| Area irrigated through surface water | 41.80 | 100 (A+) | 100 (A+) | 100 (A+) | 8.8 (D) | 93.95 (A+) | 19.64 (B) | 100 (A+) | 80.81 (B) | 100 (A+) |
| No. of tube wells per 100 ha. of cropped area | 15.47 | -- (D) | -- (D) | NA (--) | Nil (D) | 0.02 (D) | Nil | NA (--) | 1.06 (D) | 0 (D) |
| **Communication** | | | | | | | | | | |
| No. of telephone lines per hundred population | 4.37 | 4.64 (A+) | 0.9 (D) | 2.16 (D) | 2.78 (C) | 2.86 (C) | 3.28 (A) | 1.93 (D) | 1.82 (D) | 3.95 (A) |

| **Infrastructure component** | **Uttarakhand** | **Almora** | **Bageshwar** | **Chamoli** | **Champawat** | **Pauri Garhwal** | **Pithora garh** | **Rudraprayag** | **Tehri Garhwal** | **Uttarkashi** |
|---|---|---|---|---|---|---|---|---|---|---|
| Population served per post office (*2002-03*) | 3,119 | 1,830 (A+) | 1,681 (C) | 1,392 (A+) | 2,871 (A+) | 1632.51 (A+) | 1,452 (A+) | 1,849 (A+) | 4,541 (A) | 2,379 (A+) |
| Average area served per post office (sq. km.) | 19.64 | 11.7 (A+) | 11.53 (A) | 24.3 (B) | 25.06 (B) | 1761.98 (D) | 22.7 (B) | 19.83 (A+) | 14.71 (D) | 66.65 (D) |
| **Education** | | | | | | | | | | |
| Literacy rate | 71.60 | 66.19 (A) | 71.30 (A) | 64.08 (A) | 57 (B) | 66.23 (A) | 75.25 (A+) | 73.6 (A+) | 66.73 (B) | 54.63 (B) |
| Literacy rate - Male | 83.30 | 78.42 (A) | 87.64 (A+) | 75.6 (A) | 71 (A) | 76.50 (A) | 90.06 (A+) | 89.8 (A+) | 85.33 (A+) | 69.51 (B) |
| Literacy rate - Female | 59.60 | 55.90 (A) | 57.03 (A) | 52.74 (A) | 45 (B) | 56.94 (A) | 62.59 (A+) | 59.6 (A+) | 49.42 (B) | 38.81 (C) |
| No. of schools (elementary education upto Class VIII) per 1 lakh population | 168.25 | 301 (A+) | 315.38 (A+) | 313 (A+) | 250 (A+) | 324.93 (A+) | 335 (A+) | NA (--) | 277.28 (*junior basic schools*) 75.23 (*senior basic schools)* (A+) | 260.33 (A+) |
| Population served per school (elementary education upto Class VIII) | 594 | NA (--) | NA (--) | NA (--) | NA (--) | NA (--) | NA (--) | 326 (A+) | NA (--) | NA (--) |
| No. of secondary and sr. secondary schools per 1 lakh population | 61.19 | 32 (C) | 25.91 (D) | 36.96 (C) | 21 (D) | 36.87 (C) | 29 (C) | NA (--) | 30.6 (C) | 96.61 (A+) |
| Population served per school (secondary and sr. secondary school) | 1,634 | NA (--) | NA (--) | NA (--) | NA (--) | NA (--) | NA (--) | 2,645 (C) | NA (--) | NA (--) |
| No. of degree and professional colleges per 1 lakh population | 0.94 | 1.03 (A+) | 0.4 (D) | 1.89 (A+) | 0.89 (A) | 2.15 (D) | 1.3 (A+) | | 0.83 (B) | 3.39 (A+) |

| Infrastructure component | Uttarakhand | Almora | Bageshwar | Chamoli | Champawat | Pauri Garhwal | Pithora garh | Rudraprayag | Tehri Garhwal | Uttarkashi |
|---|---|---|---|---|---|---|---|---|---|---|
| Population served per degree and professional college | 106,382 | NA (--) | NA (--) | NA (--) | NA (--) | NA (--) | NA (--) | 113,720 (A) | NA (--) | NA (--) |
| Teacher- pupil ratio upto Class VIII | 1: 50 | 1: 36 (A+) | 1: 35 (A+) | 1: 31 *(upto Class V)* A+ 1 : 69 *(Class V to VIII)* (D) | 1: 40 *(upto Class V)* A+ 1 : 42 *(Class VI to VIII)* (B) | 1: 25 *(upto Class V)* A+ 1 : 30 *(Class VI to VIII)* (A) | 1: 21 *(upto Class V)* A+ 1 : 45 *(Class VI to VIII)* (A) | 1: 34 *(upto Class V)* (C), *state, 1 : 20* 1 : 48 *(Class VI to VIII)* (C), *state, 1 : 26* | | 1: 25 *(upto Class V)* (B), *state, 1 : 20* 1 : 29 *(Class V to VIII)* (A), *state, 1 : 26* |
| **Health** | | | | | | | | | | |
| No. of dispensaries and hospitals per 1 lakh population | 4.6 | 8.82 (A+) | 6.88 (A+) | 10.65 (A+) | 0.89 (D) | 0.13 (D) | 2.38 (C) | | 6.29 (A+) | 26.10 (A+) |
| No. of beds in hospitals per 1 lakh population | 83.9 | 155.53 (A+) | 63.96 (B) | 53.87 (C) | 73.66 (A) | 83.4 (A) | 133 (A+) | | 57.69 (C) | 105 (A+) |
| Doctors (modern, i.e. , allopathic system) per 1 lakh population | NA | 10.55 (--) | 9.31 (--) | NA | 9.37 | | 11.9 | | | 9.5 |
| **Water Supply** | | | | | | | | | | |
| No. of villages with drinking water supply (fully or partially) | 97.72 | 95.06 (A) | 100 (A+) | 98.97 (A+) | 98.42 (A+) | 98.6 (A+) | 98.79 (A+) | 100 (A+) | 97.62 (A) | 100 (A+) |

*Sources: Potential Linked Credit Plan 2007-2008; National Bank for Agriculture and Rural Development (NABARD), Uttaranchal Regional Office, Dehradun.*
*Note: A* - district indicator (D.I.) is either 100% or more than state indicator; A – D.I. is between 85% and 99.9%; B - D.I. is between 70% and 84.9%; C - D.I. is between 50% and 69.9%; D – D.I. is less than 50%.*

**Appendix 10 : Stakeholders in Infrastructure Development**

| Infrastructure Component | Central Government | State Government | Local Government | Private Sector |
|---|---|---|---|---|
| National Roads | PWD Plan, build and fund maintenance | State PWD to provide maintenance on behalf of national government | | |
| State Government | | Plan, build and maintain | | |
| Local roads | | Plan | Build and maintain | |
| Ropeways/ Cable cars | | Build and maintain | Build and maintain | Build and maintain |
| Railways | Railway Authority Plan; build maintain and operate | | | |
| International airports | AAI: Plan and quality control | | | |
| Domestic airports | AAI: Plan and quality control | | | |
| Electricity generation | | State electricity board, plan, build & maintain | Communal power plants, i.e., Gangotri | Electricity for private use |
| Water supply | | Irrigation Department | Treat and distribute | Collect and use |
| Waste water | | | Collect and dispose | Dispose |
| Solid waste | | | Collect and dispose | Dispose |
| Telecom (fixed lines) | MTNL Plan, build and maintain | | Several operators, Plan, build & maintain | |
| Telecom (mobile) | | | Several operators. Plan, build & maintain | |
| Telecom (Internet) | | | Several operators. Plan, build & maintain | |

**Appendix 11 : India Brand Equity Foundation (IBEF)**

http://www.ibef.org/aboutus.aspx

India Brand Equity Foundation (IBEF) is a public-private partnership between the Ministry of Commerce and Industry, the Government of India, and the Confederation of Indian Industry. It aims to effectively present the India business perspective and leverage business partnerships in a globalizing market place. IBEF regularly tracks government announcements in policy, foreign investment, macroeconomic indicators, and business trends. It collects, collates and disseminates accurate, comprehensive and current information on India. In the overall nation-branding campaign for India, IBEF plays three well-defined roles: Forum for brand vision development, Coordinator of strategic marketing initiatives, and India Resource Centre.

It works with a network of stakeholders – domestic and international – to promote the Fastest Growing Free Market Democracy. Working with stakeholders from across a wide spectrum of businesses and academia, IBEF follows a consultative and inclusive process in developing contemporary global business brands for India Inc.

IBEF produces a wide range of well-researched publications focused on India's economic and business advantages. These provide decision-makers with relevant, detailed information on opportunities and successes, and help them benchmark India against competing business destinations and leverage the India advantage to their benefit.

**Strategic Initiatives:** IBEF has taken up many initiatives. .Some of them are for building positive economic perceptions of India globally; for this, a series of road shows have been organized. These events serve as an effective "Nation Branding" platform to further strengthen the positioning of India as the world's fastest-growing free market democracy.

- IBEF led an advertisement campaign in the Financial Times of the UK projecting the business image and skills of India.
- IBEF played a key role in the successful "INDIA EVERYWHERE" campaign that left its mark on global business. www.indiaeverywhere.com
- IBEF developed the project logo and overall branding plan and ran an outdoor and print media campaign.
- IBEF developed the 'India Partner Country' literature for distribution at the Hanover Messe press conferences in India. The literature was also sent to various Indian Missions all over the world.
- IBEF support to the "Investing in India" Conference at Chicago Graduate School of Business.
- IBEF's CEO took a special session on "Brand India" as part of the IFS Officers' training module.

## Appendix 12 : Carbon Trading

Emission trading is a central authority monitored and regulated (government or international organization) mechanism for preventing the pollution caused by emissions of green-house gases produced by industries, as mandated by the Kyoto Protocol. Emission trading, dealing specifically with carbon dioxide (calculated in equivalents of carbon dioxide), is known as carbon emission trading. The bulk of emission trading is carbon emission trading. Under this mechanism, the central authority puts a cap on the amount of emission caused by a pollutant. Emission permits are issued to the companies or other groups. These companies are required to hold an equivalent number of allowances or credits representing the permissible limit of pollution emission for that pollutant. The sum of all the credits is necessarily less than the emission cap for that pollutant. The companies adopting cleaner technologies and procedures cost-effectively can successfully reduce the extent of emission that they cause. And, if the pollution caused by those is below the permissible limit for that pollutant under the mechanism, they are left with surplus credits which can be traded with those companies which find it difficult/costly to keep their pollution under the permissible limit. The companies which contribute towards pollution control are rewarded by selling the credits earned by them to those which found that difficult. This is also known as cap-and-trade.

The Kyoto Protocol also provides for industrialized countries to sponsor/invest in low pollution generating /clean projects in developing countries, and thereby earn carbon credits. It encourages developing countries (that are not yet fully industrialized) to go for low pollution emitting technologies and projects, a proposition which is relatively difficult for industrialized countries. Developing countries can achieve economic benefits by trading the credits that they earn with the industrialized countries.

Carbon trading has also now come to India. The MCX launched futures trading in carbon financial instruments in January 2008. MCX is planning to get approval from the Forward Markets Commission to launch a trading platform for primary Carbon Emission Reductions (CER). This is likely to increase the number of transactions and the level to requisite liquidity. One CER unit is equivalent to the prevention of 1 metric tonne of carbon emission. The recent UN climate change conference in Bangkok made it clear that marked-oriented arrangements such as the clean development mechanism (CDM) and emission trading ushered in by the Kyoto protocol will continue beyond the year 2012.

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