

GEOG-604



## **GEOGRAPHY OF UTTARAKHAND**



**DEPARTMENT OF GEOGRAPHY AND NATURAL RESOURCE  
MANAGEMENT**

**SCHOOL OF EARTH AND ENVIRONMENTAL SCIENCE  
UTTARAKHAND OPEN UNIVERSITY**

(Teenpani Bypass, Behind Transport Nagar Haldwani (Nainital) Uttarakhand)

**GEOG - 604**

**GEOGRAPHY OF UTTARAKHAND**



**DEPARTMENT OF GEOGRAPHY  
AND NATURAL RESOURCE MANAGEMENT  
SCHOOL OF EARTH AND ENVIRONMENTAL SCIENCE  
UTTARAKHAND OPEN UNIVERSITY**

**Phone No. 05946-261122, 261123**

**Toll free no. 18001804025**

**Fax no. 05946-164232, E. Mail [info@uou.ac.in](mailto:info@uou.ac.in)**

**Website: <https://uou.ac.in>**

---

## Board of Studies

### **Chairman**

Vice Chancellor  
Uttarakhand Open University, Haldwani

Professor R.K. Pande (Retd)  
Head & Dean, Department of Geography  
DSB Campus, Nainital

Dr. Ranju Joshi Pandey  
Department of Geography & NRM  
School of Earth, and Environmental Science  
Uttarakhand Open University, Haldwan.

Mr. Sudhanshu K. Verma  
Department of Geography & NRM  
School of Earth and Environmental Science  
Uttarakhand Open University, Haldwani

Mr. Sunil Tewari  
Department of Remote Sensing and GIS  
School of Earth and Environmental Science  
Uttarakhand Open University, Haldwani

### **Convener**

Professor P.D. Pant  
School of Earth and Environmental Science  
Uttarakhand Open University, Haldwani

Professor Subhakanta Mohapatra  
Head, Department of Geography  
IGNOU, New Delhi

Dr. Pradeep Kumar Pant  
Department of Geography & NRM  
School of Earth, and Environmental Science  
Uttarakhand Open University, Haldwani

Dr. Mohan Singh Sammal  
Department of Geography & NRM  
School of Earth and Environmental Science  
Uttarakhand Open University, Haldwani

---

## Programme Coordinator

---

Dr. Ranju Joshi Pandey

Department of Geography and Natural Resource Management

School of Earth and Environmental Science

Uttarakhand Open University, Haldwani

---

## Unit Writers

---

<b>S.No.</b>	<b>Unit Written By</b>	<b>Unit No.</b>
1.	Dr. Mohan Singh Sammal Assistant Professor School of Geography& NRM Uttarakhand Open University, Haldwani	1, 4, 8 & 13 (Wrap Up Material)
2.	Dr. Ranju Joshi Pandey Assistant Professor School of Geography& NRM Uttarakhand Open University, Haldwani	2 (Wrap Up Material)
3.	Dr. Harimohan Bhandari Assistant Professor School of Geography& NRM Uttarakhand Open University, Haldwani	3 & 10 (Wrap Up Material)
4.	Dr. Pradeep Kumar Pant Assistant Professor School of Geography& NRM Uttarakhand Open University, Haldwani	5 (Wrap Up Material)
5.	Mr. Sudhanshu kumar Verma Assistant Professor School of Geography& NRM Uttarakhand Open University, Haldwani	6 (Wrap Up Material)



6.	Dr. Dheeraj Pant Assistant Professor School of Geography & NRM Uttarakhand Open University, Haldwani	7 & 11 (Wrap Up Material)
7.	Mr. Sunil Tewari Assistant Professor School of Geography & NRM Uttarakhand Open University, Haldwani	9 & 12 (Wrap Up Material)

---

## **EDITORS**

---

**Editing of this book is in under processing...**

Title	: Introduction to Climatology
ISBN	:
Copyright	: Uttarakhand Open University
Edition	: First (2024)

Published By : Uttarakhand Open University, Haldwani, Nainital - 263139

Printed By :

## CONTENTS

<b>CONTENTS</b>		<b>PAGE NO.</b>
<b>BLOCK- 1 BLOCK 1: UTTARAKHAND:A GEOGRAPHICAL UNIT</b>		
UNIT-1	Geographical Location And Administrative Division, Historical Background and Cultural Heritage	<b>1 - 25</b>
UNIT-2	Physical Geography of Uttarakhand, Geology and geomorphology: Himalayan ranges, valleys, and Landforms	<b>26 - 37</b>
UNIT-3	Climate and weather patterns: monsoon, temperature, precipitation and Hydrology: rivers, lakes, glaciers, and water resources	<b>38 - 62</b>
UNIT-4	Ecosystem diversity: forests, grasslands, wetlands, Wildlife and conservation areas: national parks, wildlife sanctuaries, Threats to biodiversity: deforestation, habitat loss, human-wildlife conflict	<b>63 - 95</b>
<b>BLOCK 2: UTTARAKHAND: AGRICULTURE, RURAL DEVELOPMENT AND SOCIO-CULTURAL DYNAMICS</b>		
UNIT-5	Agricultural practices and cropping patterns, Rural livelihoods and socio-economic challenges and Government schemes and initiatives for rural development	<b>96 - 117</b>
UNIT-6	Ethnic diversity: indigenous communities, languages, and traditions	<b>118 – 142</b>
UNIT-7	Gender dynamics and social issues, Education, healthcare, and social welfare initiative	<b>143 – 162</b>
<b>BLOCK 3: UTTARAKHAND: URBANIZATION, INFRASTRUCTURE AND TOURISM</b>		
UNIT-8	Urban growth and demographic trends	<b>163 – 189</b>
UNIT-9	Infrastructure development: transportation, energy, communication, urban planning challenges and sustainable development strategies	<b>190 – 218</b>
UNIT-10	Tourism industry: pilgrimage sites, hill stations, adventure tourism, Cultural heritage: temples, monuments, traditional art form	<b>219 – 241</b>
<b>BLOCK 4: UTTARAKHAND: DISASTER RISK AND MANAGEMENT AND SUSTAINABLE DEVELOPMENT CHALLENGES</b>		

UNIT-11	Geological and Climate induced hazards: earthquakes, landslide, floods, droughts, avalanches and Disaster preparedness and mitigation strategies	<b>242 – 263</b>
UNIT-12	Emerging trends and opportunities in Uttarakhand	<b>264 -290</b>
UNIT-13	Policy implications and recommendations for sustainable development	<b>291 – 315</b>

## **BLOCK 1: UTTARAKHAND: A GEOGRAPHICAL UNIT**

---

### **UNIT-1 GEOGRAPHICAL LOCATION AND ADMINISTRATIVE DIVISIONS, HISTORICAL BACKGROUND AND CULTURAL HERITAGE**

---

#### **1.1 OBJECTIVES**

#### **1.2 INTRODUCTION**

#### **1.3 GEOGRAPHICAL LOCATION AND ADMINISTRATIVE DIVISIONS, HISTORICAL BACKGROUND AND CULTURAL HERITAGE**

- *1.3.1 UTTARAKHAND: GEOGRAPHICAL LOCATION*
- *1.3.2 Uttarakhand: Administrative Department*
  - *1.3.2.1 Legislature*
  - *1.3.2.2 Local Self-Government - (Rural Body)*
- *1.3.3 Uttarakhand: Historical Background*
- *1.3.4 Uttarakhand: Cultural Heritage-*

#### **1.4 SUMMARY**

#### **1.5 GLOSSARY**

#### **1.6. ANSWER TO CHECK YOUR PROGRESS**

#### **1.7 REFERENCES**

#### **1.8 TERMINAL QUESTIONS**

---

## **1.1 OBJECTIVES**

---

- To study the geographical position of Uttarakhand in the globe.
  - To make a broad overview and analysis of the administrative departments.
  - To discuss the historical background of the state of Uttarakhand.
  - To provide knowledge to the learners about the cultural heritage of Uttarakhand.
- 

## **1.2 INTRODUCTION**

---

Uttarakhand state is geographically a Himalayan state located in the northern part of India, which is completely situated in the lap of the Himalayas, most of which are mountainous and hence absorb the mountainous climate. As an independent state, this state became the 27th and 11th Himalayan state of the country on 9 November 2000, it borders Nepal in the east, Himachal in the west, Tibet in the north and Uttar Pradesh in the south. Geographically, this state is spread over 53,483 sq km. Physically, the state exhibits the characteristics of mountain ranges, Bugyal, Ghatia, riverine plains, Bhabar and Terai land. On one side, Nanda Devi mountain peak is situated and on the other side, Bhabar-Terai land is also situated here. Developed glaciers like Gangotri, Yamunotri and Milan, alpine grass below the snow line, evergreen, deciduous dense forests, natural beauty, and mountain terrace farming, on the other hand, the flat fertile agricultural land of the plains adorns it with physical features in the form of storage of food grains and makes it unique among other Himalayan states.

Even after adverse physical conditions, it is recognized as the densest region due to being a part of the world with the best environmental conditions. Administratively, this state is divided into two divisions (Kumaon and Garhwal), thirteen districts, 95 development blocks, 110 tehsils, 102 municipal bodies and 15,745 villages. The temporary capital of the state is located in Dehradun and Gairsain. The length of the state from east to west is 358 km and the width is 320 km of which 625 km is the international border with China and Nepal. According to the census of the year 2011, the total population of the state was 1.01 crore whereas in the estimates of 2023, it is expected to be around 1.15 crore. In the historical background, the state of Uttarakhand is considered to be a land with a very rich spiritual culture since ancient times. This region has been an important part of Indian civilization since the Vedic period. Here is the place of penance of Adi Guru

Shankaracharya, Kedarnath, the origin of the sacred river Ganga, and many religious places like Haridwar, Rishikesh, Yamunotri, Gangotri, Badrinath, Jagannath, Bagnath, Chitai Golu Devta Temple and Hatkalika and the place of penance of hundreds of sages and monks. During the Mahabharata period, it was known as Jharkhand and Manas Khand.

During the medieval period, this region was divided into the kingdoms of many small kings, in which the kings of Katyuri, Panwar, Chand and Shah Dynasties were prominent. In the 19th century, except for the Tehri heritage, this region was a part of the United Provinces of Agra and Awadh under the British. After independence in 1947, it was identified as a hilly region of Uttar Pradesh state, but after a long movement in the demand for a separate state, it was constituted as an independent state in the year 2000. The state's language, dialect, folk songs, dances, festivals, religious places, fairs, Dev Jagar stories, local folk architecture, handicrafts, food, customs and ancient temples and Gurudwaras have been prominent as cultural heritage of the state, while in modern times, tourist areas, forest wealth, glaciers, national parks, sanctuaries, burials and mountain lifestyle have become major heritages which are the basis of livelihood for the residents of the state in complex geographical features. In the plains, industrial, urban, health, education and technical institutions are being created as future heritage for development. Thus, the state's geographical location, administrative departments, historical background and cultural heritage have been integral parts of the state which are visible in the lifestyle of Uttarakhand.

---

### **1.3 GEOGRAPHICAL LOCATION AND ADMINISTRATIVE DIVISIONS, HISTORICAL BACKGROUND AND CULTURAL HERITAGE**

---

#### **1.3.1 UTTARAKHAND: GEOGRAPHICAL LOCATION**

Uttarakhand state is geographically a hilly state situated in the northern part of India. It comes at 11th position in the order of Himalayan states. Geographically, this state is situated 100% in the Himalayan mountain range and Bhabar formed by the sediments of the Himalayas and some parts of the Terai land. The state of Uttarakhand is spread to an average height of 7817 km. above sea level, which includes the regions from the Great/Greater/High Himalayas to the Terai. About 86 percent of the state's land area of 46035 sq km. is a mountainous region and 14 percent of the area of 7,448 sq km. is of the plain Bhabar and Terai land. Geologically, this state has been a part of the first, second and

third uplift of the Himalayan mountain range, while the plains are formed by the sediments of the rivers originating from the Himalayas.

It is a new state both administratively and geologically. On one hand, the physical features of Uttarakhand state provide it with uniqueness and on the other hand, the cultural heritage and the residents of the state with their distinct features provide it with a distinct identity among all the states of the country. Physically, this state is the region of the Ganga river system and in the form of Ganga Pradesh, it shows its separateness from the whole earth. A brief introduction of the geographical location of the state is presented as follows.

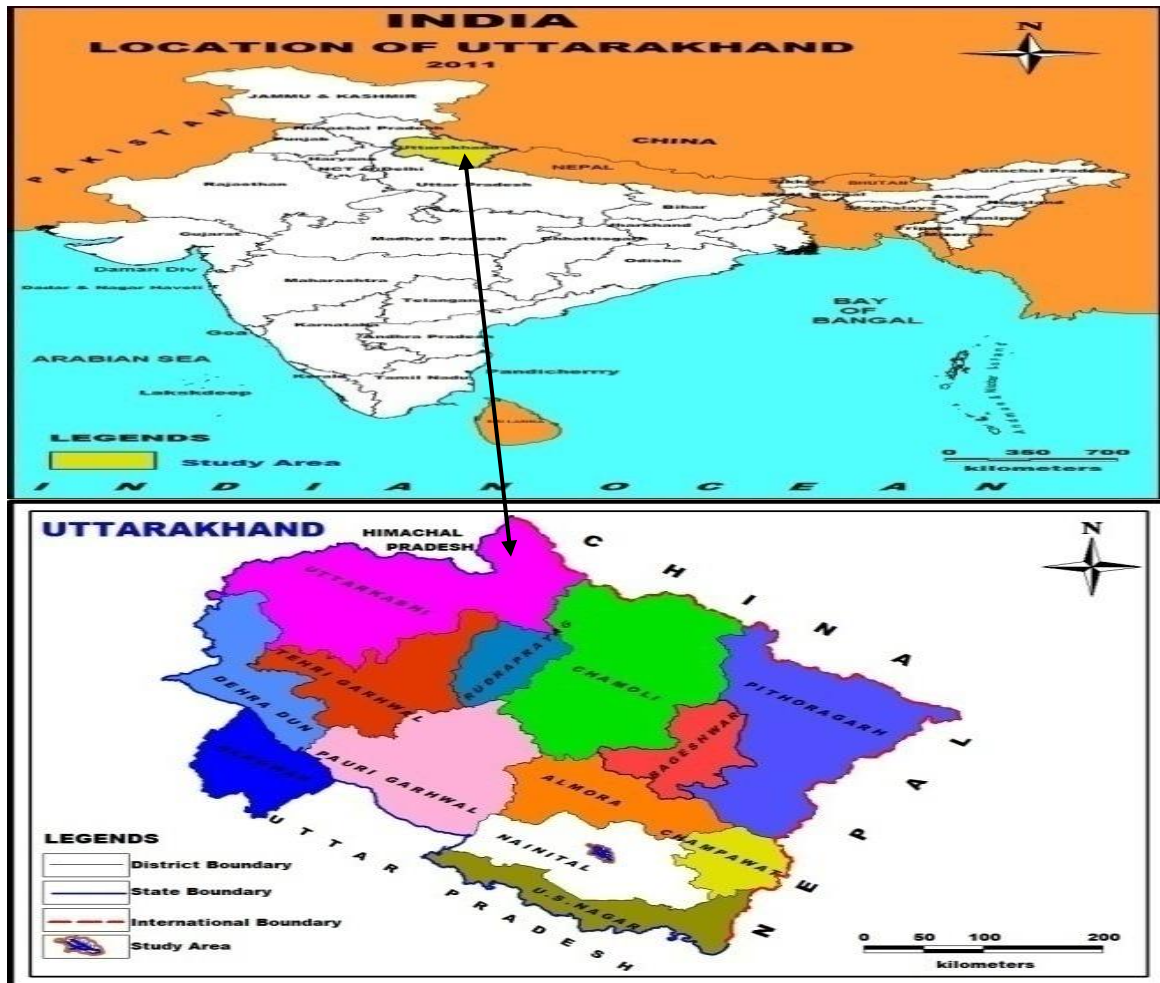
**Location and Extension-** Uttarakhand state is spread in the globe from 28.43 north latitude to 31.28 north latitude showing a difference of 2.44 and from 77.32 east longitude to 81.02 east longitude showing a difference of 3.28. The east-west expansion of the state is 358 km and the north-south expansion is 320 km. Which is spread over 53483 sq km and 1.69 percent area of India? While 10 percent of the Indian Himalayan region and 16 percent of the western Himalayas are included in it, in terms of political boundaries, the state is situated between Nepal in the east and Himachal in the west. The natural boundaries have been determined by the Kali River in the east and the Tons River in the west. The north is determined by the Chinese-occupied Tibet and the southern part is determined by the Terai region of the ancestral state of Uttar Pradesh. While the shape of the state is rectangular, till the year 2000 it was a part of the state of Uttar Pradesh. The total international border of the state is 625 km. It is with China (Tibet) in the north and Nepal in the east. While the maximum border is with Uttar Pradesh and the minimum is with the Himalayas. In territorial terms, Kumaon and Garhwal regions have been included in it, based on which it is called Garhkum in the combined name. While Sydney Burrard has said that it is located in the Kumaon Himalaya range, in the context of India, it is called the Middle Himalayas. There are many types of diversities in the geographical location of the state of Uttarakhand.

As the state of Uttarakhand is situated in the Himalayan mountain range, there are many mountain ranges (Nanda Devi, Kamet, Mana, Badrinath, Chaukhamba, Trishul Panchachuli, Kedarnath, Doodhatoli, Shrikanth, Yamunotri and Bandarpoochh) here. In between the mountains, soft silky grasslands, Bugyal and Payal, and many valleys and passes have been created by Ganga, Yamuna, Kali, Sarayu and other small rivers, the fertile plains on the banks of which are known as Doon. Apart from this, the cities of

Bageshwar, Kausani, Garun, Bhikiyasen, Nadasain, and Srinagar spread their unique beauty by being situated in the river valley plains. On the other hand, the glaciers located in the state flow continuously flowing rivers and the origin of Ganga, Yamuna and Kali Rivers also originate here. The forest wealth of the state which is located in 45.44 percent area of approximately 24,303.04 sq. km. of the state, has forests ranging from alpine grassland to evergreen, temperate, subtropical and deciduous forests, which naturally create universal geographical conditions for tourism, which is possible only due to the mountainous features of the state.

Structurally, the state of Uttarakhand is a part of the sediments of the Tethys Sea, whose present position is the result of the upliftment of the Himalayan mountain range in different periods. From the structural point of view, the state has not yet reached a completely stable state, in which many types of geological and tectonic activities keep on taking place from time to time, due to which many types of disasters like earthquakes, flood, landslides and cloudburst keep on occurring, which also present evidence of its instability, which is known as Trans Himalayan Fault, Main Central Fault, Main Border Fault and Himalayan Front Fault, which separate the land area formed after each new uplift of the Himalayas. Due to these uplifts, the location of most of the 11 districts of the state is completely mountainous, except Dehradun, Nainital, Pauri and Champawat, Haridwar and Udham Singh Nagar are located in the plains. Thus, the geographical and latitudinal position of Uttarakhand is different in the map of the world and India, it creates a different identity not only in natural form but also in cultural and spiritual form.





Source: Mohan Singh Sammal, 2020 Research Dissertation Geography Kumaon University, Nainital

### 1.3.2 Uttarakhand: Administrative Department-

In the undivided Uttar Pradesh, the mountainous region of the present Uttarakhand state was not developed comprehensively and the action plans made for the plains were not implemented in the mountainous region, due to which the foundation of the people's movement was laid on the plan to separate the western part of Uttar Pradesh as an administrative unit. The division of the administrative units of the state was determined based on the difference in the geographical, economic, resource and socio-cultural structure of the plain areas of the state, which was later accepted by the Central Government and the Uttaranchal State Bill was passed in the Lok Sabha on August 1, 2000, by cutting off the mountainous and some plain areas of Saharanpur, Rampur, Pilibhit and Bijnor districts of Uttar Pradesh as a mountainous state. On November 9, the northern part of Uttar Pradesh was called Uttaranchal (Northern part of Uttar Pradesh) by combining the two divisions of Kumaon and Garhwal. When the state was made an independent state by giving administrative legal approval to the Aachal (part), the capital

of the state was Dehradun, but on 1 January 2007, the name was changed from Uttaranchal to Uttarakhand. Like other states of the country, there is a provision to run the administration by Chapter 6, Articles 152 to 237 of the Constitution, in which under the parliamentary system, there is an executive (Governor, Council of Ministers, Secretariat, other departments and Advocate General), legislature and high and subordinate courts.

Before the census year 2001, the administrative departments of the state were classified by creating the former eight districts (Uttarkashi, Chamoli, Tehri Garhwal, Almora, Pithoragarh, Nainital and Haridwar) and 5 new districts (Rudraprayag, Dehradun, Udham Singh, Bageshwar and Champawat) and dividing them into a total of 13 districts, thus forming the present Uttarakhand. These 13 districts were divided into two parts- Garhwal Division seven districts (Haridwar, Dehradun, Tehri, Pauri, Rudraprayag, Chamoli and Uttarkashi) and Kumaon Division six districts (Pithoragarh, Champawat, Bageshwar, Almora, Nainital and Udham Singh Nagar). At present, the state has been administratively divided into different departments, which 13 districts, 13 district councils, 110 tehsils, 18 sub-tehsils, 95 development blocks (82 mountainous and 13 plain), 150 municipal bodies, 670 judicial panchayats, 7791-gram panchayats and 12167 forest panchayats have been formed. Apart from this, the entire Uttarakhand has been divided into 3 Rajya Sabha constituencies, 5 Lok Sabha constituencies and 70 Vidhan Sabha constituencies in the state. Apart from this, there has been a demand for the establishment of a commissioner and four new districts for a long time. Apart from this, the administrative units keep getting divided from time to time and new administrative units keep getting formed. After the establishment of the state, apart from divisions, districts and development blocks, there have been changes in all of them, in which the biggest change has been done in the areas of Nagar Nigam. 13 districts have been included in the large units of administrative departments, whose brief introduction has been given in Table No. 1.1.

<b>District</b>	<b>District Headquarters</b>	<b>Area</b>	<b>Development Block</b>
Almora	Almora	3144	12
Nainital	Nainital	4251	9
Pithoragarh	Pithoragarh	7090	13
Bageshwar	Bageshwar	2241	6
Champawat	Champawat	1766	5
Udham Singh Nagar	Rudrapur	2582	8

Haridwar	Haridwar	2360	4
Dehradun	Dehradun	3088	7
Rudraprayag	Rudraprayag	1984	4
Tehri	Tehri	3642	12
Pauri	Pauri	5329	12
Chamali	Gopeshwar	8030	12
Uttarkashi	Uttarkashi	8016	6

Source: Exam Vani Uttarakhand

**1.3.2.1 Legislature-** At the time of the formation of Uttarakhand state, an independent legislature was established in which the Legislative Assembly and the Governor were made the main parts of the Legislature.

**1. Governor-** The Governor is in the first place in the Legislature without his signature no bill can be passed, apart from this all legislative work is done by the Governor.

**2. Legislative Assembly-** At present, the number of members in the state assembly has been fixed at 70, who are elected for five years by persons above 18 years of age under the direct voting system. The qualification for a member of the Legislative Assembly is that he should be 25 years of age, he should not hold any post of profit in the state or the centre, and he should not be included in the criteria of disqualification set by the Parliament. The tenure of the members of the Legislative Assembly is generally 5 years, but in a national emergency, it is dissolved even earlier. At the time of the formation of the state, the number of assembly members was 22. After the delimitation of the constituency on 5 November 2001, the number of assembly seats has been increased from 22 to 70. After the possibility of a new delimitation in the year 2025, more new members can be added. At present, there are 55 general, 13 Scheduled Caste and 2 Scheduled Tribe members in the assembly.

**1.3.2.2 Local Self Government - (Rural Body)** Under local administration and governance, a District Magistrate, Sub-District Magistrate Tehsil, Block, District Panchayats, Nyaya Panchayats and Gram Panchayats are working as administrative officers in each district. At present, thirteen District Magistrates and 110 Sub-District Magistrates and Tehsildars, 13 District Development Officers 95 Block Development Officers and 670 Nyaya Panchayat Officers are working administratively in 13 districts. Apart from this, 102 city administrators are also working in the chain of administration in

urban areas. While the District Panchayat, Area Panchayat and Gram Panchayats are working as the rulers, in every district, the District Panchayat has been given the topmost status under Panchayati Raj, in which the President of the District Panchayat presides over the Panchayat in the district, which is elected by the elected members of the District Panchayat. The head of the Area Panchayat is the Block Pramukh, whose election is done by the Area Panchayat members. The Gram Pradhan, Lok Sabha member, Rajya Sabha member, and Legislative Assembly member coming under the Panchayat in the Block section are ex-officio members of the Area Panchayat. The Secretary of the Panchayat is the BDO.

The work of the Panchayat is conducted through 6 types of constituted committees. The Area Panchayat works as a link between the District Panchayat and the Gram Panchayat. In this, the Gram Panchayat also works at the lowest level, in which the number of members is at least 5 and a maximum of 15, in which the Gram Pradhan is the head of the Gram Sabha. Municipal bodies- Municipal bodies in the state are an autonomous governance system which works at three levels (Municipal Corporation, Municipal Council and Nagar Panchayat). The head of the Municipal Corporation is the Mayor and the members are councillors. Their tenure is also 5 years. While the head of the Municipality is the Municipal Chairman and its elected members are councillors. Similarly, in the Nagar Panchayat, the ruler is the Nagar Panchayat Chairman and the elected members are its associates. Thus, the administrative and governance system of the state has been determined at different levels.

### **1.3.3 Uttarakhand: Historical Background-**

The historical development of the state of Uttarakhand has been Gauvarshali. This region has been providing its distinct identity in natural and spiritual form since ancient times, as a result of which it is called Devbhoomi. In Indian mythological literature, it was named Kedarkhand and Manaskhand, in which Garhwal Mandal is currently known as Kedarkhand and Kumaon Mandal as Manaskhand. According to paleo-historical records, Himalayan states like Dvigarta, Trigarta and Madra have been prosperous in this region. This part situated in the north of the country has also been under the rule of Brahmapur and Strughna states which were located in the south-east and north-west of Alaknanda respectively. While in Kumaon, during ancient times, the valley and coastal area of Kali River, the present Champawat district is known as Kumaon which at present comprises 6 districts (Pithoragarh, Bageshwar, Champawat, Almora, Nainital and Udham Singh

Nagar). The area of 52 forts is included under the Garhwal region which is known as Garhwal country. According to the authenticity of the dynasties, the state of Uttarakhand was ruled by the Kunindas before the sixth century, and the Katyuris from the sixth to the twelfth century, which were divided into many small states, the main ones among which were (Kali Kumaon, Doti, Askot, Barmandal, Katyur, Danpur, Dwarahat and Lakhanpur).

The Garhwal region was divided into 52 forts, which were merged by King Ajaypal and named the present Garhwal Mandal. In the medieval period, the Chand and Parmar dynasties (1400-1790 AD) contributed significantly to the expansion of Uttarakhand. They brought the small states of the mountainous region under their rule, after which the Chand kings gradually took control of the Terai-Bhabar region along with the mountainous regions by merging it with Kumaon. Like the Chand rulers of Kumaon, the Parmar rulers of Garhwal annexed the areas of the neighbouring kingdoms (up to the upper valley of the Sutlej River) to their kingdom. Similarly, Pradyumn Shah (1787-1804 A.D.) annexed the territories of the neighbouring kingdoms (up to the upper valley of the Sutlej River) to their kingdom.

On 27 April 1815, the British rule merged the entire Kumaon and the eastern part of the Garhwal region which extended up to the Alaknanda and Mandakini rivers and the Doon valley region into the state of Uttarakhand. It was given the special status of a western hilly province and the Kumaon and Garhwal Commissionerate was formed and its headquarters were established in Nainital. In 1858, British rule took over the entire India and in 1901, a part of it was merged into the Agra and Awadh province and in 1947, this part was again called Uttar Pradesh. Till 1960, Uttarakhand was divided into four districts (Almora, Nainital, Pauri and Tehri Garhwal) which were controlled by the Commissioner of Kumaon Division. After 1960, three districts Pithoragarh, Chamoli and Uttarkashi were created by cutting them from Almora, Pauri and Tehri Garhwal respectively. In 1968, Uttarakhand was divided into two divisions, Kumaon and Garhwal, and the headquarters of Kumaon division was made in Nainital and the headquarters of Garhwal division was made in Pauri, but Dehradun was merged with Meerut district, which is currently a part of Garhwal division. Due to separation from the mainstream of development, the Hill Development Council was established in 1967 for all-round development, which was later established as the Ministry of Hill Development.

However, due to a lack of development as per expectations, movements were started from time to time to create a hill state. On 9 November 2000, the formation of

Uttarakhand state was announced, to maintain balance between the hilly and plain areas and to maintain the religious and social uniformity of the region, Haridwar district was merged with Uttarakhand and the foundation of a new state was laid. In the historical sequence, the basis of the movement of Uttarakhand can be understood more easily date-wise by looking at the struggles that were done for separate states. Background of separate state- The demand for a separate Himalayan state started before independence. It was first raised in the special session of the Indian National Congress held in Srinagar on 5-6 May 1938, in which Jawaharlal Nehru supported it. It was first raised in the special session of the Indian National Congress held in Srinagar on 5-6 May 1938.

In the same year, Sridev Suman formed Garhadesh Seva Sangh for a separate state. In 1938, an organisation called Parvatiya Vikas Jansamiti was formed for a large Himalayan state by combining Himachal and Uttaranchal. Fazal Ali Commission in 1955. In 1967, the formation of Parvatiya Rajya Parishad at the Ramnagar conference, the Parvatiya Vikas Parishad in 1969, the Kumaon National Front in 1970, the Uttaranchal Parishad in 1972, the Uttaranchal Youth Council in 1976, the Janata Party formed the Uttaranchal Rajya Parishad in 1979 and the Uttaranchal Utthan Parishad in 1988, etc. had agitated for a separate state. In 1990, Jaswant Singh, MLA of Uttarakhand Kranti Dal, presented the first proposal for a separate state in the assembly. In the 1991 elections, BJP prominently included the establishment of a separate state of Uttarakhand in its manifesto. In July 1992, Uttarakhand Kranti Dal prepared the blueprint of Uttarakhand state by proposing Gairsain as the capital of the separate state. In January 1993, Uttar Pradesh Chief Minister Mulayam Singh Yadav constituted a cabinet committee for the state and capital under the chairmanship of Urban Development Minister Ramashankar Kaushik.

It presented a report on a separate state in May 1994, which was accepted by the Uttar Pradesh government on June 21, 1994. But on 1 September 1994, in Khatima of Udham Singh Nagar, 25 people died when the police fired on students and ex-servicemen. This incident was protested in Mussoorie, in which 7 agitators were killed. On 2 October 1994, the Uttar Pradesh Police killed 6 agitators by inhumanly treating them and molesting the women, who were going to participate in the Delhi Rally, at Rampur Tiraha. In 1995, the Uttaranchal Movement Steering Committee was formed, on 15 August 1996, Prime Minister H. D. Deve Gowda announced the creation of the state of Uttaranchal, in 1998, the Central BJP Government presented a bill in the Lok Sabha, on 27 July 2000, the Uttar Pradesh Reorganisation Bill 2000 was presented in the Lok Sabha, on 28 August, President



K.R. Narayanan gave his approval to the Uttar Pradesh Reorganization Bill and indicated it as Law No. 28 in the Official Gazette and on 9 November 2000, Uttaranchal State was formed as the 27th state. Thereafter, on 1 January 2007, its name was changed from Uttaranchal to Uttarakhand, but the dispute over the permanent capital has still not been resolved, due to which two capital regions, Dehradun and Gairsain, have been made the capitals of the state. Thus, the historical development of Uttarakhand State has been the result of long struggles, but the most painful period has been the period from independence to the date of formation of the state. Because of the complex geographical structure of the state, in which most of the area is mountainous, desolate, deserted, forest, difficult climate and uninhabited, a separate state could not be formed easily.

**1.3.4 Uttarakhand: Cultural Heritage-** The cultural heritage of Uttarakhand is unique and rich, in which the old traditions, folk tales, music, handicrafts and local festivals of the state have an important place. Cultural diversity is what distinguishes it from other neighbouring states because each culture has its unique cultural elements. Based on these characteristics, various castes and tribes have been coming to the state since ancient times, and have been leaving some cultural characteristics in their places of residence as heritage for the past, present and future through their caste characteristics and arts. Apart from the architecture, temple construction art, building construction art, handicraft art (iron and copper utensils, woodcraft, spinning-weaving) established by Katyur, Chand, Panwar, Pal and other clans as heritage, the deity jaguar system, sage muni tapo that, religious places (Kankhal, Haridwar, Rishikesh, Kedarnath, Badrinath, Jageshwar and others), painting, local food dishes, religious tours, fairs, cultural costumes and customs, other things have also been a part of the cultural heritage.

The cultural heritage of Uttarakhand is so extensive that along with the country, foreigners also come here every year to know the culture of the state. The geographical diversity physically acts as a lifesaver in the cultural heritage. The high mountains of the Himalayas, river valleys, waterfalls, lakes, hot and cold water pools, mythological religious places and tourist spots are the main ones. A detailed description of the cultural heritages of Uttarakhand is being presented through the following headings.

**1. Folk tales and traditions-** The folk tales of Uttarakhand mainly include stories of gods and goddesses, kings and queens and saints, in which the tradition is still kept alive in the form of stories of ancestors and mythological stories which reflect the social values in

the state, the folk tales include the stories of Pandavas, Nanda Devi, Shiv-Parvati Katha, Nada Rajjaat, Nyayakari Golu Devta Jagar Katha, Kalu Bhandari, Rajula Malu Shahi Katha, Teelu Rauteli, Jiyarani, Suraj Kaul, Jeetu Bagdwal, Jagdev Panwar, Kaitura, Brahmakuvar and Pawade.

**2. Music and dance-** The tradition of traditional music and dance art of Uttarakhand is very ancient, and is performed on various occasions with folk songs or to the tune of musical instruments, which has its style, language, singing time and method. Mainly love songs, seasonal songs, dance songs, auspicious or ritual songs, religious ballads, secular folk ballads, songs of a particular caste and entertaining songs are popular in the form of music which the entertaining songs include Basanti, Hori, Baju Band, Khuder Kulachar, Chaiti Chaumasa, Barahmasa, Thadiya, Saroon, Harul, Budiyat Pandavart Mandaan, Chauphala, Langvir, Tandi dance, Jhumailon, Chachri, Chhopti, Ghuguti, Bhaila-Bhaila, Sipaiya, Ranbhoot, Pavaada, Jagar, Lota, Jhora, Bair, Bhagnaul and Chhalia dance which are specially presented on some religious events and festivals.

**3. Handicrafts-** Handicrafts have been a rich ancient tradition of the state, which is currently taking the form of the home handicraft industry, while in Uttarakhand this business has been a means of livelihood since ancient times. Handicrafts mainly include handicrafts by skilled artisans, weaving, wood carving, copper utensils, clay dishes, leather crafts, statues (Baman statue, Adi Badri statue, Shesh-shayan statue, dancing pose statue, and auspicious statue), Jageshwar, Lakhamandal temple construction art and painting.

**4. Festivals-** Apart from national festivals, some local festivals are also celebrated in the state and have their specialities, most of the festivals are connected with the ideology of conservation of nature like Harela is a folk festival directly based on tree plantation which is celebrated as Uttarakhand Environment Day, Phoolsangrad/Phooldei is a symbol of the spring season, Panchami is the position of the Sun in Uttarayan and special importance is given to the Rabi crop barley, cleanliness and hygiene is taken care of during Deepawali, Ganga Dussehra is an indicator of the arrival of the rainy season in the month of Jyeshtha, Khatduwa is celebrated as animal health protection, Kalai, indicating the period of ripening and harvesting of crops, Aathu, wishing women to always be married, Bhirauli, organised for the welfare of children, all the festivals are being celebrated at the local level since a long time as a part of the culture and heritage of the state.



**5. Religious places-** Uttarakhand is known as Devbhoomi since ancient times because there are many religious places here in which many gods and goddesses are worshipped. Along with this, the construction style and infrastructure of the religious places here are unique in the world. The Archaeological Department is working to preserve many places as heritage. The major religious places include Kedarnath, Badrinath, Gangotri, Yamunotri, Haridwar, the world's highest temple Tungnath, Rudranath, Jwala Devi, Hemkund, Chandrabadni, Neelkanth Mahadev, Triyugi Narayan, Kalimath, Patal Bhuvneshwar, Purnagiri, Katyayani, Binsar Mahadev, Dunagiri, Mansa Devi, Maya Devi, Laxman Jhula, Ram Jhula, Dhari Devi, Bhairavgarhi, Adi Badri, Chota Kailash and Shiv Dham Vishwa Mahadham Haidakhan are the major religious places which are the centre of faith in the country as well as abroad.

**6. Language and Literature-** Uttarakhand has also been a part of the origin of Sanskrit as a state language, the proof of which is many books written in Dev Vani Sanskrit language by Pantjali, Vyas, Shankaracharya and Kalidas. Apart from this, the establishment of Sanskrit schools, colleges and ashrams is direct evidence of the birthplace of Sanskrit. In the state Sanskrit language, Hindi language and Kumaoni, Garhwali, and Jaunsari dialects are being used by the local people here in speech and literature writing. Whereas Bengali and Punjabi languages are used in the Terai region. In the development of local language i.e. dialect, folk writers have created Kumaoni, Garhwali and Jaunsari literature. Apart from this, bhajans, ballads, proverbs and folk songs have been written in Jaunsari, Kumaoni and Garhwali languages. Prominent writers include Sumitra Nandan Pant, Gauri Dutt, Shailesh Matiyani and Chandrakunwar Bartwal.

**7. Costumes and Dress-** The traditional dress or apparel of Uttarakhand has a distinct identity at the regional level which makes its place among the selected cultures of the country; the clothing of the residents proves to help adjust easily with the extreme climate here. There has been a tradition of covering the whole body in women's dresses, Angadi, Gaati, Dhoti, Pichora, Lehenga, Vest and Choli are the main clothes, while the main clothes for men are dhoti, churidar pyjama, white cap, basket, kurta, Mirjai coat, shirt, hand-woven vest and turban, whose design and spinning-weaving reveal an excellent specimen based on local handicrafts.

**8. Painting-** Along with Uttarakhand's heritage sculpture, painting also gets an excellent place in the world heritage because rock paintings made in ancient times such as Lakhu,

Gwarkhya, Kimani village, Lwethaap, Petshaal and Phalasima caves are prime examples, as are the paintings of Garhwal style, especially Mola Ram art, which even today can be seen in the museums of countries like London, France, Britain, America apart from the state. Apart from this, Aipan, Thapa, Naat or Tupuk, Vasundhara, Jyoti Matrika, Prakirna and Lakshmi Pau are the main local folk paintings even today. At present, for the conservation of this painting, the government is getting Aipan and other artistic items made in nameplates and is promoting it in the fairs and exhibitions held in the state by the self-help groups and is making it a means of livelihood.

**9. Traditional musical instruments** - Mainly traditional musical instruments are used in religious and cultural events of the state. The musical instruments are divided into different types based on their manufacturing material like metal instruments include ghanta, VINAI, brass plate, ghunghru, tongs and khajri; leather instruments include dhol, nagada, tabla, dafli, hudki, saiya, damau and dhatima; string instruments include sarangi, one star, two star, veena and blow instruments include trumpet, raising, conch, mochhal, flute and masqabin; other instruments include harmonium, guitar and organ, whose tunes are related to classical music.

**10. Fairs and Yatras-** Fairs and Yatras organized in Uttarakhand have been a prominent event since the time of human origin and are being organized in specific periods for a long time. The oldest and the biggest fair among the fairs is the world famous Kumbh Mela which is famous in every corner of the world. In other local fairs, Nanda Devi Fair, Shravani Fair, Somnath Fair, Gannath Fair, Syalde-Bikhauti Fair, Purnagiri Fair, Ashadhi Kautik Bagwal Fair, Ladidhura Fair, Thal Fair, Jauljivi Fair, Magh Fair, Bissu Fair, Tapkeshwar Fair and Uttarayani Historical Fair are organized mainly in different parts of the state. Among the Yatras, Nanda Rajjatra, Hilljatra, Kailash Mansarovar Yatra, Khatling-Rudra Devi Yatra, Dayvora Yatra, Pawnali Kantha-Kedar Yatra, Sahastra Tal-Mahatal Yatra, Varuni Panchkosi Yatra and Arakot-Askot Yatra are the main ones whose primary objective is environmental awareness and Dev Darshan, such is the local belief of the residents here. These are unique Yatras of the world.

**11. Traditional food-** Some local dishes of the state which are made and eaten only in some regional and geographical areas are an integral part of the cultural identity of the state. The main food items which are famous in the local food dishes like Palak Kapa, Phaanu, Chans, Jhoi, Bhat ki Churkani, Aloo ke Gutke, Rajma Dal, Jhangora ki Kheer,

Bichhoo ki Sabzi, Jangli Gethi, Maize and Maduwa roti, Red paddy rice etc. are very tasty which are rich in taste and nutrition and also have many types of medicinal properties. On the basis of these characteristics, at present, these food items are being given a special geographical identity by the government.

**12. Tribal Cultures-** The physical and cultural characteristics of the tribal communities like Jaunsari, Boksa, Tharu, Bhotia and Raji living in the state of Uttarakhand give them a distinct identity in the entire state. Their lifestyle, folk festivals, and social customs are especially different from other people. For example, tribal handicrafts and textile art, shawls, carpets and warm clothes of Munsiyari and Chamoli and the housing style of high Himalayan places have become an integral part of the cultural heritage of the state.

**13. Marriage and rituals-** Uttarakhand is the abode of many classes of human communities and tribes, marriage and other cultural rituals are also performed differently in all societies. Especially in tribal society, marriage rituals are completed in one week, whereas in mountain society, it is performed in a 2-3 day event with auspicious songs in which different types of rituals and worship of nature are done. Even for the last several years, the wedding ceremony has been linked with nature, for example, the Maiti movement organizes tree plantation programs during marriages, which connects environmental protection with a close attachment. On the other hand, many Indian and foreign citizens are adopting the special marriage system of Uttarakhand, due to which the famous temples here are getting crowded, especially in the Triyugi Narayan temple, rituals like marriage are being organized by foreigners with great pomp and show. In this way, the marriage system of the state will make its mark at the global level as the heritage of the state in the future.

So the cultural heritage of Uttarakhand has been preserved by the ancestors of Uttarakhand as a valuable heritage for the state and its citizens, which is currently working to unite the people of the state as well as attract the world community towards itself and will continue to do so.

---

## **1.4 SUMMARY**

---

Uttarakhand state is geographically situated in the Himalayas, most of which is mountainous. Uttarakhand state is spread latitudinally on the globe between 28.43 north latitude to 31.28 north latitude and 77.32 east longitude to 81.02 east longitude. The east-

west extension of the state is 358 km. The north-south extension is 320 km. The total area is 53483 sq km which is 1.69 percent of the total area of the country. As far as political boundaries are concerned, the natural boundary of the state is formed by the rivers Kali and Tons flowing in Nepal in the east and Himachal in the west. While the northern boundary is determined by Tibet and the southern boundary is determined by the Terai region of Uttar Pradesh, till the year 2000 this part was a part of Uttar Pradesh state, territorially Kumaon and Garhwal regions have been included in it. In India, it is also called the Central Himalayan State, which was the 11th Himalayan State formed on 9 November 2000.

Physically, mountain ranges, Bugyal, Ghatia, river coastal plains, Bhabar and Terai land are the basis of physical division in the state. Administratively, this state is divided into two divisions (Kumaon and Garhwal), thirteen districts, 95 development blocks, 110 tehsils, 102 municipal bodies and 15,745 villages. The temporary capital of the state is located in Dehradun and Gairsain. In the estimates for the year 2023, the population of the state is estimated to be 1.15 crores. In the same historical background, the state of Uttarakhand is considered to be a very prosperous land since ancient times. This region has been an important part of Indian civilization since the Vedic period. This state has been the place of penance of Adi Guru Shankaracharya. In the Mahabharata era, it was known by the names of Kedarkhand and Manas Khand, while after 1947 it was known as the mountainous region of Uttar Pradesh state, but after becoming a separate state, the state currently has its legislature which has 70 assemblies members. Apart from this, the activities of governance and administration are being conducted at various levels by the district administration and Panchayati Raj system of 13 districts in the state.

Due to being separated from the mainstream of development, the demand for a separate state had started before independence. After independence, this demand became very strong in many organizations and movements took place, prominent among them were Sridev Suman, and Garhdesch Seva Sangh, 1950 An organization called Parvatiya Vikas Jansamiti was formed for a large Himalayan state by combining Himachal and Uttaranchal, Fazal Ali Commission in 1955, formation of Parvatiya Rajya Parishad in 1967 Ramnagar conference, Parvatiya Vikas Parishad in 1969, Kumaon National Front in 1970, Uttaranchal Parishad in 1972, Uttaranchal Yuva Parishad in 1976, Uttaranchal Rajya Parishad by Janata Party in 1979 and Uttaranchal Utthan Parishad in 1988, organizations like these agitated for a separate state. The separate state was accepted by the Uttar

Pradesh government on 21 June 1994 by implementing the suggestions of the Kaushik Committee.

On 15th August 1996, Prime Minister HD Devegowda announced the formation of Uttaranchal state, in 1998, the Central BJP government presented the bill in Lok Sabha, on 27th July 2000, Uttar Pradesh Reorganization Bill 2000 was presented in Lok Sabha and on 28th August, President KR Narayanan gave his assent to the Uttar Pradesh Reorganization Bill and on 9th November 2000, Uttaranchal state was formed as the 27th state. As a cultural heritage of the state, the language, dialect, folk songs, dances, festivals, religious places, fairs, Dev Jagar stories, local folk architecture, handicrafts, food, customs, clothing, ancient temples, paintings, means of entertainment and food have been major parts of the cultural and spiritual heritage. Thus, the geographical location of the state, administrative departments, historical background and cultural heritage have been an integral part of the state, which reflect the lifestyle of Uttarakhand and are currently becoming a means of livelihood, which the government is working to include in the World Heritage and protect.

---

## **1.5 GLOSSARY**

---

Geographical Location	The geometric and latitudinal position of a piece of land on the globe is called geographical location.
Manaskhand	In Aitereya Purana, Kumaon Mandal was called Manaskhand.
Mandal administratively	Divided political units such as Garhwal and Kumaon, two commissionerate units.
Midos	Soft grasslands are found below the snow line which are lush green in summer.
River Coastal Plain	The plains formed on the banks of the river and small plains formed by the river in the mountain valley region are included in this category.
Bhabar	Fan-shaped plain in the mountain foothills is known as Bhabar.

Tarai	Tarai Plain is made of fine particles that start after Bhabar, which contains water in sufficient quantity.
Gangotri	The thick layer of frozen snow from which the river Ganga originates.
Kedarkhand	In the Puranas, the oldest name of Garhwal Mandal was Kedar Khand. Snow line The last limit of trees in the Himalayan region from where snow accumulates is known as the Snow line.
Folk festival	Festivals are celebrated in regional areas like Harela, Teej, Ghughutiya Makar Sankranti.
Sangoli Treaty	The treaty made between the British and the Gurkhas in 1815 is known as Sangoli Treaty.
Handicraft	Items made without machine help like Kaline, Aipan, Rigang baskets etc.
Folktales	Popular stories coming from ancient times can be of a king, queen, sage folk deity etc.
Cultural heritage	Items received by the state from ancestors which are made with some special quality and art or cannot be made again in the present times like Chand and Katyuri temples, Chitrashila inscription, Mola Ram painting etc.
Woodcraft	Artistic figures made of wood by local craftsmen are prepared in a particular place only.

## **1.6. ANSWER TO CHECK YOUR PROGRESS**

---

- Geographically Uttarakhand state is a Himalayan state and comes at 11th place in the order of formation.
- Uttarakhand state was established on 9 November 2000 as the 27th state.
- The total geographical area of the state is 53,483 sq km.
- Administratively Uttarakhand state is divided into two divisions (Kumaon and Garhwal).
- The length of the state from east to west is 358 km and the width is 320 km.
- Uttarakhand has an international border of 625 km with China and Nepal.
- About 86 percent of Uttarakhand state i.e. 46035 sq km of land area is included in the mountainous region.
- The shape of the state is spread in rectangular form.
- The name of the state was changed from Uttaranchal to Uttarakhand on 1st January 2007.
- In mythological literature, Uttarakhand was named Kedarkhand and Manaskhand.
- 52 forts are included in the Garhwal region.
- According to the authenticity of the dynasties, the Kuninda dynasty ruled Uttarakhand before the sixth century and the Katyuri dynasty ruled from the sixth to the twelfth century.
- The Sangouli Treaty was signed in 1815 between the British and the Gorkhas.
- The demand for a separate state was first made in the special session of the Indian National Congress held in Srinagar on 5-6 May 1938 before independence.
- In 1938, Sridev Suman founded Garhadesh Seva Sangh as a separate state.
- Uttarakhand was accepted as a separate state by the Uttar Pradesh government on 21 June 1994.
- In the Government Act, the state of Uttaranchal was formed under law number 28.
- The cultural heritage of Uttarakhand includes old traditions, folk tales, music, handicrafts and local festivals.
- The folk tales of Uttarakhand mainly include stories of gods and goddesses, kings and queens and saints.
- Handicrafts include handicrafts, weaving, wood carving, and copper utensils done by skilled artisans.

---

## 1.7 REFERENCES

---

- Kharkwal, S. C.: 2017, Uttarakhand A Geographical Analysis of Physical, Cultural & Economic Scenario; Binsar Publishing Co. Dehradun U.K.
- Maithani, D.D., Prasad Gaytri, Noutiyal Rajesh, 2015. Geography of Uttarakhand. Sharda Pustak Bhawan, University road Prayagraj. U.P.
- Pant, B.R. Chand, R. Mehata B.S.: 2022, Uttarakhand Janshankhya Pardrashya Evam Parivartan; Pahad Publication Talalital Nainital. Uttarakhand.
- Sah, N.K., Bhatt, S.D., Panday, R.K.: 1990, Himalaya: Environment, Resource and Development; Shree Almora Book Depot Almora. Uttarakhand.
- Sammal. M.S. 2020: Climate Change Impact on Agriculture, Food Security & Human Health in Balliya Catchment, Kumoun Himalaya; Unpublished Research Thesis, Kumoun University, Nainital.
- Trapathi, Keshari Nandan: 2022, Pariksha vani Uttarakhand Eak Samagra Adhyayan; Bodik Publication Paryagraj U.P.

---

## 1.8 TERMINAL QUESTION

---

### *(A) Long Type Questions*

**Q-1.** Explain the chart location and expansion of Uttarakhand state, and describe the administrative departments of the state in detail?

**Q-2.** Explain the cultural heritage, explaining the historical scenario of Uttarakhand state.

### *(B) Short answer type questions*

**Q-1.** What is the latitudinal expansion of Uttarakhand, explain.

**Q-2.** By which name was Uttarakhand known in mythological history, describe in detail.

**Q-3.** Describe the major administrative departments of Uttarakhand state.

**Q-4.** What are the names of the districts of Uttarakhand during British rule and what are the districts formed after 1960?

**Q-5.** Describe the mythological history of Uttarakhand state?

**Q-6.** Explain the separate Uttarakhand movement in detail?

**Q-7.** What do you mean by folk tales?



**Q-8.** What do you understand by local self-governing institutions?

**Q-9.** Describe the handicraft art of Uttarakhand?

**Q-10.** Explain in detail the main dance arts and festivals of Uttarakhand?

***(C) Multiple choice questions***

**Q-1.** Geographically Uttarakhand is located in?

- A) Himalayan range
- B) Mountainous region
- C) Desert land
- D) Forest land

**Answer A**

**Q-2.** When was the state of Uttarakhand established?

- A) 9 September 2000
- B) 9 November 2000
- C) 9 December 2000
- D) 9 October 2000

**Answer D**

**Q-3.** In the order of Himalayan states, Uttarakhand is ranked?

- A) 10th state
- B) 11th state
- C) 12th state
- D) 13th state

**Answer B**

**Q-4.** The total geographical area of Uttarakhand is?

- A) 53463 sq km

- B) 53473 sq km
- C) 53583 sq km
- D) 53,483 sq km

**Answer D**

**Q-5.** What is the length of the state from east to west?

- A) 358 km
- B) 320 km
- C) 520 km
- D) 640 km

**Answer A**

**Q-6.** Uttarakhand state shares its 625 km international border with which countries?

- A) China
- B) Nepal
- C) Both of the above
- D) None of the above

**Answer C**

**Q-7.** How much of the land area of Uttarakhand state is mountainous?

- A) 46035 sq km
- B) 47035 sq km
- C) 48035 sq km
- D) 49035 sq km

**Answer A**

**Q-8.** On which date was the name changed from Uttaranchal to Uttarakhand?

- A) 2 January 2006
- B) 1 January 2007

- C) 1 January 2008
- D) 1 January 2004

**Answer B**

**Q-9.** How many forts were included in the Garhwal region?

- A) 56 forts
- B) 55 forts
- C) 53 forts
- D) 52 forts

**Answer 4**

**Q-10.** When and between whom was the Sangouli Treaty signed?

- A) 1816 Nepal and British
- B) 1815 Gorkha and British
- C) 1915 Gorkha and British
- D) All of the above

**Answer B**

**Q-11.** Which organisation was established by Sridev Suman for a separate state?

- A) Garhdesh Seva Sangh
- B) Mountain Development Council
- C) Uttaranchal Council
- D) Uttaranchal Utthan Parishad

**Answer A**

**Q-12.** When did the Khatima incident take place?

- A) 1 December 1994
- B) 1 October 1994
- C) 1 September 1994

D) 1 November 1994

**Answer C**

**Q-13.** When was the Uttarakhand Bill presented in the Lok Sabha by the BJP government?

A) 27 July 2000

B) 28 July 2000

C) 29 July 2000

D) 30 July 2000

**Answer A**

**Q-14.** Which of the following is included in the cultural heritage of Uttarakhand?

A) Folk tales

B) Music, handicrafts

C) Local festivals

D) All of the above

**Answer D**

**Q-15.** Which of the following is included in the songs of the people of Uttarakhand?

A) Love or romance songs

B) Seasonal songs, dance songs

C) Mangal or sanskar songs

D) All of the above

**Answer D**

**Q-16.** Which of the following is included in the handicraft art of Uttarakhand?

A) Weaving

B) Wood carving

C) Copper crafts

D) All of the above

**Answer D**

---

**UNIT-2 PHYSICAL GEOGRAPHY OF UTTARAKHAND,  
GEOLOGY AND GEOMORPHOLOGY: HIMALAYAN  
RANGES, VALLEYS, AND LANDFORMS**

---

***2.1 OBJECTIVES***

***2.2 INTRODUCTION***

***2.3 PHYSICAL GEOGRAPHY OF UTTARAKHAND, GEOLOGY  
AND GEOMORPHOLOGY: HIMALAYAN RANGES, VALLEYS,  
AND LANDFORMS***

***2.4 SUMMARY***

***2.5 GLOSSARY***

***2.6 ANSWER TO CHECK YOUR PROGRESS***

***2.7 REFERENCES***

***2.8 TERMINAL QUESTIONS***

## 2.1 OBJECTIVES

---

After reading this unit you should be able to:

- Explain physical geography of Uttarakhand.
  - Discuss Geology and Geomorphology of Uttarakhand.
  - Understand Himalayan ranges, valleys, and landforms.
- 

## 2.2 INTRODUCTION

---

Knowledge of Geological structure, Geomorphology, Physical Geography is very important of a country, state, and any region. Geological structure affects the formation of landforms, vegetation growth, formation of soil, agriculture etc. Uttarakhand Himalaya is the world's youngest folded mountain range. Most of its part was formed before the Pleistocene era or in the tertiary era. It can be called the youngest mountain chain. It is an integral part of Himalaya. Most of the scientist agree with the opinion that "the formation process of Himalaya is still active," then it can also consider true that Uttarakhand is rising. Before understanding the physical structure of this state, it is very important to understand its Geological structure. You covered the Geographical location and administrative divisions, historical background, and cultural heritage in the previous unit of this block. In this unit, we will learn about physical Geography of Uttarakhand, Geology and Geomorphology. After that you will learn Himalayan ranges valleys and landforms of Uttarakhand.

---

## 2.3 PHYSICAL GEOGRAPHY OF UTTARAKHAND, GEOLOGY AND GEOMORPHOLOGY: HIMALAYAN RANGES, VALLEYS, AND LANDFORMS

---

### PHYSICAL GEOGRAPHY OF UTTARAKHAND

The northern Indian state of Uttarakhand is well-known for its untamed landscapes, diverse ecosystems, and rough terrain. Part of the greater Himalayan region, it is primarily mountainous and renowned for both its natural beauty and religious significance. An outline of Uttarakhand's physical landscape is provided below:

#### 1. Location and Boundaries

- **Geographical Coordinates:** Between 28°43' and 31°27' North latitude and 77°34' and 81°02' East longitude.
- **Boundaries:**
  - **North:** China (Tibet Autonomous Region).
  - **East:** Nepal.
  - **West and South:** Uttar Pradesh.
  - **South:** Himachal Pradesh.
- The state covers an area of approximately 55,683 square kilometers.

## 2. Topography

**Mountains:** Uttarakhand is a predominantly mountainous state, forming part of the central and eastern sections of the Himalayas. The topography of the state is separated into two areas:

- **Garhwal Himalayas (Western Uttarakhand):** This area is well-known for its valleys, rivers, and hill stations and is home to some of the highest peaks. The Garhwal region is home to well-known peaks like Trishul (7,120 meters) and Nanda Devi (7,816 meters), which is India's second-highest mountain.
- **Kumaon Himalayas (Eastern Uttarakhand):** Several mountain ranges, valleys, and lakes define the Kumaon region. Pindari Glacier are prominent peak in this area.
- **High Altitudes:** The Zaskar, Mussoorie, and Kumaon mountain ranges are among the several mountain ranges in the state. The foothills are around 300 meters high, whereas the tallest peaks are nearly 7,000 meters high.
- **Valleys:** Uttarakhand has several important valleys, including the **Doon Valley, Kumaon Valley, and Garhwal Valley.**

## 3. Rivers and Water Bodies

- **Rivers:** Uttarakhand is commonly known as the "Land of Rivers" because of the several significant rivers that flow through it, most of which originate from the Himalayan glaciers.
  - One of the holiest rivers in Hinduism, the Ganges (known as the Ganga in India) originates from the Gangotri Glacier in the Garhwal area.
  - Another important river that passes through the state is the Yamuna, which originates from the Yamunotri Glacier.
  - Other major rivers include the **Alaknanda, Bhagirathi, Kali, and Saraswati.**
- **Lakes:** The state is home to several high-altitude lakes such as **Nainital Lake, Bhimtal, Sattal, and Hemkund Lake.**

## 4. Climate and Vegetation

- **Climate:** Uttarakhand's varied topography causes it to experience a wide range of climate variations. At higher elevations, the climate is alpine, but in the lowlands it is subtropical.
  - **Tropical** in the foothills and valleys, with hot summers and mild winters.
  - **Temperate** climate in the mid-hills, with cooler temperatures year-round.
  - **Alpine** climate in the higher mountains, with freezing temperatures and heavy snowfall in winter.
- **Vegetation:** Uttarakhand is known for its rich biodiversity and forests.
  - **Himalayan subtropical broadleaf forests** dominate the lower elevations.
  - **Temperate forests** (oak, deodar, and pine) are found in the mid-hills.



- **Alpine meadows** with grasslands, shrubs, and wildflowers are seen at higher elevations.
- The **Jim Corbett National Park**, one of the oldest national parks in India, is in the foothills of Uttarakhand.

### 5. Soil Types

- **Alluvial soils:** Found in the river plains, especially in the **Terai** and **Bhabar** regions.
- **Mountain soils:** Fertile soils are found in the higher reaches, while shallow, less fertile soils dominate the upper elevations.
- **Forest soils:** In the forested areas, soils are rich in organic matter, supporting dense vegetation.

### 6. Natural Resources

- **Minerals:** Uttarakhand is rich in mineral resources, including limestone, mica, copper, and quartz.
- **Forest Resources:** The state has extensive forest cover and is a major producer of timber, medicinal plants, and herbs.
- **Hydropower:** The state is an important site for hydropower generation because of its rugged terrain and large number of rivers. On the Bhagirathi River lays the Tehri Dam, one of the biggest in India.

### 7. Ecological Zones

- **Terai and Bhabar:** These are the foothill regions, characterized by grassy plains, forests, and wetlands.
- **Shivaliks:** The outermost range of the Himalayas, home to a variety of species of plants and animals.
- **Mid-hills and Upper-hills:** These regions are characterized by temperate and alpine vegetation, and are also where many of the state's famous hill stations are located.
- **High-altitude areas:** Above 3,000 meters, the vegetation transitions into alpine meadows and glaciers, with snow-covered landscapes in the winter.

### 8. Flora and Fauna

- Uttarakhand has a diverse range of flora and fauna due to its varied climatic zones. The state is home to many endangered species like the **Bengal Tiger**, **Leopard**, **Snow Leopard**, and **Himalayan Musk Deer**.
- The **Jim Corbett National Park**, **Rajaji National Park**, and **Nanda Devi Biosphere Reserve** are major conservation areas in the state.

## GEOLOGY AND GEOMORPHOLOGY OF UTTARAKHAND

The northern Indian state of Uttarakhand is known for its complicated diverse geomorphology and geology. A unique landscape has been formed by the region's wide

variety of landforms, rock types, and tectonic processes. An outline of Uttarakhand's main geological and geomorphological characteristics is provided below:

### 1. Tectonic Setting

Uttarakhand is situated in the Himalayan Mountain range, which is the result of the ongoing collision between the Indian Plate and the Eurasian Plate. This tectonic collision began around 50 million years ago and continues to the present day, making the region seismically active and geologically dynamic. The state is also part of the larger Himalayan orogenic belt.

#### Key Tectonic Units:

- **Himalayan Frontal Thrust (HFT):** The Indian Plate is being dragged under the Eurasian Plate in this major fault system. The Siwalik range and the Lesser Himalayas are separated by the HFT.
- **Main Boundary Thrust (MBT):** one of the main features of structure that separates the Higher and Lesser Himalayas.
- **Main Central Thrust (MCT):** The boundary between the Higher and Lower Himalayas is marked by a deep and important fault. It is linked to major geological processes, such as the Higher Himalayas' get higher.

### 2. Geological Divisions of Uttarakhand

The geological structure of Uttarakhand is broadly divided into four distinct zones:

- **Siwalik Range (Outer Himalayas):** Over millions of years, the higher ranges were eroded, creating the Siwaliks, a group of sedimentary rocks. They are mostly composed of conglomerates, siltstones, and sandstones that were deposited in a foreland basin. Due to their location at the front of the tectonic collision, the Siwaliks are known as well for their strong seismic activity.
- **Lesser Himalayas:** Most of the rocks in this zone are metamorphic, including slates, gneisses, and schists. The rocks of the Lesser Himalayas, which are situated between the MBT and MCT, are generally older than those in the Siwaliks.
- **Greater Himalayas (Higher Himalayas):** Mostly composed of crystalline rocks like granite, gneiss, and schist, these mountains are the highest and roughest in the world. The Main Central Thrust (MCT) and the MCT are separated by the Greater Himalayas. This area, which is primarily made up of severely folded and metamorphosed rocks, is home to some of Uttarakhand's tallest peaks, such as Nanda Devi (7,816 meters).
- **Tibetan Plateau and Trans-Himalayan Region:** The Tibetan Plateau has an influence on this area in northern Uttarakhand, which is made up of volcanic deposits and younger, less metamorphosed sedimentary rocks.

### 3. Geomorphology of Uttarakhand

The landscape of Uttarakhand is characterized by steep elevation changes that result in a wide range of landforms. Erosion, glaciation, sediment deposition, and tectonic activity all contribute significantly to the geomorphology.

#### Major Landforms:

- **Mountain Ranges and Peaks:** Uttarakhand is home to the Chaukhamba, Trishul, and Nanda Devi, three magnificent Himalayan peaks. These peaks are frequently found in complicated glacial systems that formed the terrain over time.
- **Valleys:** The major valleys of Uttarakhand are formed by rivers like as the Yamuna and Ganges, as well as their tributaries. The Alaknanda Valley and the Bhagirathi Valley are two prominent examples that were formed by glacial processes and tectonic uplift.
- **Rivers and River Basins:** Rivers like the Ganga, Yamuna, Bhagirathi, and Alaknanda have significantly influenced the geomorphology of Uttarakhand. These rivers have carved out deep gorges, canyons, and river terraces, particularly in the Higher Himalayas. River valleys are often characterized by steep slopes and rapid water flow.
- **Glacial Landforms:** Uttarakhand is home to numerous glaciers, including the Gangotri and Nanda Devi glaciers, which have formed U-shaped valleys, glacial lakes, cirques, and moraines. Many of the glacial lakes, such as Ratti Tal and Vasundhara Tal, are formed in the upper Himalayan highlands.
- **Landslides and Erosion:** Due to the state's steep slopes and heavy monsoon rainfall, landslides are common in Uttarakhand. These landslides have caused extensive erosion and deforestation, which has significantly altered the geomorphology of numerous parts of the state.
- **Plateau and Terraces:** In the lowest regions of the Lesser Himalayas, rivers have slowly left behind broad, level plains known as plateaus or river terraces.
- **Karst Topography:** Many parts of the state, especially those along the Uttar Pradesh border, have karst topography. This happens when limestone rock dissolves, forming distinctive landforms like caves and sinkholes.

### 4. Seismic Activity and Earthquakes

The entire state of Uttarakhand is in either seismic zone IV or V, with zone V being the most seismically active. The continuous collision between the Indian and Eurasian tectonic plates is the cause of this. This area has seen many earthquakes, including notable ones like the 1991 Uttarkashi earthquake and the 1999 Chamoli earthquake.

## 5. Flora and Fauna Adaptations to the Terrain

- Uttarakhand's diverse geological and geomorphological features also support a variety of ecosystems, ranging from temperate forests to alpine meadows. The complex topography and elevation gradients create a range of habitats for a variety of flora and fauna.
- **Forest Zones:** The state has dense forests of oak, deodar, pine, and rhododendron, and alpine meadows at higher elevations.
- **Wildlife:** The state's varied topography provides habitats for a wide range of wildlife, including the Bengal tiger, Himalayan tahr, musk deer, and various species of pheasants.

Known as the "Land of Gods," Uttarakhand is a northern Indian state situated in the middle of the Himalayas. The area is important for geography, tourism, and environmental preservation because of its striking mountain ranges, deep valleys, and distinctive landforms. An outline of Uttarakhand's major Himalayan peaks, valleys, and landforms may be found below:

### 1. Himalayan Ranges in Uttarakhand

Uttarakhand is home to several significant Himalayan ranges, each with its distinct geographical features. The prominent ranges include:

#### a. Garhwal Himalayas

- **Location:** Central and western part of Uttarakhand.
- **Characteristics:** The Garhwal region includes some of the highest peaks of Uttarakhand and is renowned for its spiritual and natural beauty.
- **Major Peaks:**
  - **Nanda Devi** (7,816 meters) – The highest peak entirely within India, considered sacred by the locals.
  - **Trishul Peak** (7,120 meters) – Known for its trident-like shape.
  - **Kamet Peak** (7,756 meters) – The second highest peak in Uttarakhand.
- **Notable Features:** It is known for steep slopes, alpine meadows, and rugged terrain.

#### b. Kumaon Himalayas

- **Location:** Eastern part of Uttarakhand, bordering Nepal.
- **Characteristics:** The Kumaon Himalayas are slightly lower in elevation compared to the Garhwal ranges but are still home to several notable peaks and valleys.
- **Major Peaks:**
  - **Nanda Kot** (6,861 meters) – A prominent peak in the Kumaon region.
  - **Trishul** (7,074 meters).
  - **Pindari Glacier** – Known for its scenic trekking routes.

- **Notable Features:** This range includes lush forests, alpine meadows, and several trekking paths, including the famous trek to **Pindari Glacier**.

### c. Himalayan Sub-Ranges and Extensions

- **Zaskar Range:** Part of the larger Tibetan plateau, extending into parts of Uttarakhand.
- **Sivalik Hills:** The foothills of the Himalayas located at the southern edge of Uttarakhand.

## 2. Major Valleys in Uttarakhand

Uttarakhand is also known for its beautiful valleys, which are carved by rivers originating from the glaciers of the high Himalayas.

### a. Alaknanda Valley

- **Location:** The Alaknanda Valley is in the Garhwal region and is formed by the Alaknanda River, which originates from the glaciers of the Nanda Devi region.
- **Notable Features:** The valley is known for its spiritual significance, as it is the route to several pilgrimage sites like **Badrinath** and **Rishikesh**.

### b. Kumaon Valley

- **Location:** Located in the Kumaon region, this valley is formed by several rivers including the **Kosi**, **Suyal**, and **Nandakini**.
- **Notable Features:** The valley has rich biodiversity and picturesque landscapes, including the popular hill stations like **Nainital**, **Almora**, and **Ranikhet**.

### c. Gangotri Valley

- **Location:** Located in the Garhwal Himalayas, it is a part of the larger **Bhagirathi River** system.
- **Notable Features:** Known for its spiritual significance as the Gangotri Glacier is the source of the **River Ganges**. The valley has steep gorges and high-altitude meadows.

### d. Pindari Valley

- **Location:** Situated in the Kumaon region, the Pindari Valley is surrounded by the **Pindari Glacier** and several other glaciers.
- **Notable Features:** It is one of the most scenic valleys, popular for trekking. The valley is surrounded by high peaks like **Nanda Kot**, **Nanda Devi**, and **Trishul**.

### e. Bhagirathi Valley

- **Location:** Situated in the Garhwal Himalayas, it is part of the region through which the **Bhagirathi River** flows.
- **Notable Features:** Known for its glacial sources and high-altitude terrains, it is a major route for trekkers and pilgrims visiting the **Gangotri** temple.

### 3. Landforms of Uttarakhand

Uttarakhand's landforms are a blend of rugged terrain, valleys, glaciers, and alpine meadows. The major types of landforms in Uttarakhand include:

#### a. Glaciers

- **Gangotri Glacier** – The source of the River Ganges.
- **Pindari Glacier** – Popular trekking destination.
- **Nanda Devi Glacier** – Located near the sacred Nanda Devi peak.
- **Kedarnath Glacier** – Originates near the **Kedarnath Temple**.

#### b. Rivers

- The state is crisscrossed by several important rivers, many of which have glacial origins:
  - **Ganga** (Bhagirathi River) – Flowing through the Gangotri Valley.
  - **Yamuna** – Originates from the Yamunotri Glacier.
  - **Alaknanda** – Flows through the Garhwal region.
  - **Tungabhadra, Saryu, and Kosi** are other notable rivers in the Kumaon region.

#### c. Mountain Passes

- **Kunzum Pass** – A strategic pass in the Garhwal region.
- **Niti Pass** – A high-altitude pass connecting Uttarakhand with Tibet.
- **Tharali Pass** – A historic route in the Kumaon region.

#### d. Himalayan Foothills

- The **Sivalik Hills**, which are the outermost range of the Himalayas, form the southern boundary of Uttarakhand. These hills are characterized by lower altitudes, forests, and valleys.

#### e. Alpine Meadows

- These are high-altitude grasslands found in the Garhwal and Kumaon regions. Popular meadows include **Bugyal** (alpine meadows) like **Auli Bugyal, Dayara Bugyal, and Bedni Bugyal**.

### 4. Ecological Zones and Biodiversity

Uttarakhand's topography leads to diverse ecological zones ranging from subtropical forests in the foothills to alpine meadows in higher altitudes. This variation supports a rich biodiversity:

- **Subtropical forests** in the lower elevations (Sal, Khair, and Sissoo trees).

- **Temperate forests** in mid-altitudes (Oak, Pine, Deodar).
- **Alpine and subalpine vegetation** at higher elevations, including Rhododendron and medicinal herbs.

---

## 2.4 SUMMARY

---

Uttarakhand's beautiful mountains, rivers, valleys, and varied ecosystems define its physical geography. Its distinctive natural beauty arises from its central Himalayan location, which offers abundant biodiversity and a range of terrains that accommodate anything from adventure sports and ecotourism to religious pilgrimages. The state is a significant ecological and hydrological zone due to its natural resources and landscapes.

Uttarakhand's geology and geomorphology indicate a tectonically active and geologically young region. In addition to constructing the stunning Himalayan peaks and valleys, the continuous collision between the Indian and Eurasian plates has produced an ecosystem that is continuously changing because of processes like erosion, glacial, and seismic activity. Due to the interaction of these elements, Uttarakhand is a dynamic and geologically rich area with a varied landscape that is highly interesting from an ecological and scientific standpoint.

The Himalayan ranges, valleys, and landforms of Uttarakhand provide a stunning combination of natural peaks, serene valleys, abundant wildlife, and spiritual importance. In addition to serving as a refuge for hikers and environment enthusiasts, the state's topography has a big impact on the way of life and cultural legacy of its citizens. Whether it is the majestic glaciers like Gangotri and Kedarnath, the green valley's like Pindari or Alaknanda, or the majestic peaks of Nanda Devi and Kedarnath, Uttarakhand is a place where spirituality and natural beauty interact together.

---

## 2.5 GLOSSARY

---

- **Geomorphology-** The study of the physical features of the surface of the earth and their relation to its geological structures.
- **Glaciers-** A mass of ice that moves slowly down a valley.
- **Peaks-** The pointed top of mountain.
- **Valleys-** The low land between two mountains or hills, which often has river flowing through it.
- **Environment-** The conditions in which you live, work etc.
- **Ecology-** The relationship between living things and their surroundings.
- **Meadows-** A field of grass.
- **Landforms-** A natural features of the earth surface.
- **Foothills-** Hills or low mountains at the base of a higher mountain.
- **Seismic activity-** The frequency and severity of earthquakes in each region.
- **Lakes-** A large area of water that is surrounded by land.
- **Climate-** The normal weather conditions of a particular region.



- Interact- To communicate or mix with somebody.
- Natural- Existing in nature; not made or caused by human beings.

---

## 2.6 ANSWER TO CHECK YOUR PROGRESS

---

- Uttarakhand has several important valleys, including the **Doon Valley**, **Kumaon Valley**, and **Garhwal Valley**.
- The Zaskar, Mussoorie, and Kumaon mountain ranges are among the several mountain ranges in the state.
- Uttarakhand is known as the "Land of Rivers".
- The Ganges (known as the Ganga in India) originates from the Gangotri Glacier in the Garhwal area.
- Uttarakhand is a home of several high-altitude lakes such as **Nainital Lake**, **Bhimtal**, **Sattal**, and **Hemkund Lake**.
- Uttarakhand is rich in mineral resources, including limestone, mica, copper, and quartz.
- Uttarakhand has extensive forest cover and is a major producer of timber, medicinal plants, and herbs.
- The **Jim Corbett National Park**, one of the oldest national parks in India, is in the foothills of Uttarakhand.
- Uttarakhand state is home of the Chaukhamba, Trishul, and Nanda Devi, three magnificent Himalayan peaks.
- The Alaknanda Valley and the Bhagirathi Valley are two prominent examples that were formed by glacial processes and tectonic uplift.
- **Nanda Devi** (7,816 meters) is the highest peak entirely within India, considered sacred by the locals.
- **Trishul Peak** (7,120 meters) is known for its trident-like shape.
- **Kamet Peak** (7,756 meters) is the second highest peak in Uttarakhand.
- **Nanda Kot** (6,861 meters) is a prominent peak in the Kumaon region.
- **Pindari Glacier** is known for its scenic trekking routes.
- **Zaskar Range** is a part of the larger Tibetan plateau, extending into parts of Uttarakhand.
- **Sivalik Hills** is the foothills of the Himalayas located at the southern edge of Uttarakhand.
- **Gangotri Glacier** is the source of the River Ganges.
- **Pindari Glacier** is a popular trekking destination.
- **Nanda Devi Glacier** is located near the sacred Nanda Devi peak.



- **Kedarnath Glacier** is originates near the **Kedarnath Temple**.
- **Kunzum Pass** is a strategic pass in the Garhwal region.
- **Niti Pass** is a high-altitude pass connecting Uttarakhand with Tibet.
- **Tharali Pass** is a historic route in the Kumaon region.

---

## 2.7 REFERENCES

---

<https://www.adb.org/sites/default/files/linked-documents/38272-044-sd-05.pdf>.

<https://www.motherhooduniversity.edu.in/pdf/Publications/2016/2..Research%20Paper.pdf>.

<https://www.researchgate.net/publication/371815621> Gender Inequality in India A Comprehensive Analysis and Implications for Sustainable Development.

<https://www.researchgate.net/publication/373617498> Unveiling Gender Dynamics An In-depth Analysis of Gender Realities.

<file:///C:/Users/user/Downloads/s44202-022-00054-2.pdf>.

<https://academic.oup.com/tbm/article/14/1/13/7130278?login=false>.

<https://motherhooduniversity.edu.in/pdf/Publications/2016/2..Research%20Paper.pdf>.

[https://nhsrcindia.org/sites/default/files/practice\\_image/HealthDossier2021/Uttarakhand.pdf](https://nhsrcindia.org/sites/default/files/practice_image/HealthDossier2021/Uttarakhand.pdf).

<https://onlinelibrary.wiley.com/doi/full/10.1111/1467-9566.13008>.

Pant. B.R. *et all*; 2022: Uttrakhand jansankhya: paridrishya evam parivartan, pahad phaundeshan parikrma Tallital Nainital, 49-266 pp

---

## 2.8 TERMINAL QUESTIONS

---

1. Explain the physical Geography of Uttarakhand.
2. Write an essay on Geology of Uttarakhand.
3. Explain the Geomorphology of Uttarakhand.
4. Write in detail the Himalayan ranges of Uttarakhand?
5. Explain various landforms of Uttarakhand.
6. Discuss the valleys of Uttarakhand?

---

**UNIT-3 CLIMATE AND WEATHER PATTERNS: MONSOON, TEMPERATURE, PRECIPITATION AND HYDROLOGY: RIVERS, LAKES, GLACIERS, AND WATER RESOURCES**

---

**3.1 OBJECTIVES**

**3.2 INTRODUCTION**

**3.3 DEFINITIONS**

**3.4 CLIMATE AND WEATHER PATTERNS: MONSOON, TEMPERATURE, PRECIPITATION**

**3.5 HYDROLOGY: RIVERS, LAKES, GLACIERS AND WATER RESOURCES**

**3.6 SUMMARY**

**3.7 GLOSSORY**

**3.8 ANSWER TO CHECK YOUR PROGRESS**

**3.9 REFERENCES**

**3.10 TERMINAL QUESTIONS**

### **3.1 OBJECTIVES**

---

After studying this unit you will be able to understand:

- Weather and climate represent distinct yet interconnected phenomena.
  - The patterns of rainfall distribution across Uttarakhand.
  - The temperature variations experienced in Uttarakhand.
  - An overview of the various micro-climatic zones present in Uttarakhand.
  - The water resources of Uttarakhand include its rivers, lakes, and glaciers.
- 

### **3.2 INTRODUCTION**

---

Uttarakhand, located on the southern slopes of the Himalayas, features a climate that ranges from sub-tropical forests at lower altitudes to glacial conditions at higher elevations, spanning from 200 to 7,817 meters above sea level. The region's diverse climate is influenced by its topography, with microclimate zones being more significant than macroclimate zones. However, a better network of meteorological stations is needed for accurate assessments. By categorizing mountainous areas by altitude, variations in temperature and precipitation can help classify Uttarakhand's climatic zones. The state is rich in rivers, primarily fed by glaciers in the north, including the Ganga, Yamuna, and their tributaries, which hold cultural and historical significance. These sacred rivers, replenished by Western Himalayan glaciers, contribute to Uttarakhand's spiritual importance.

---

### **3.3 DEFINITION**

---

In climatology, climate and weather are distinct concepts. Weather refers to short-term atmospheric conditions in a specific location, while climate represents long-term patterns and averages. According to **Koppen and De Logue**, weather is the atmospheric state at a specific time and place, while climate summarizes prolonged weather patterns. **Critchfield** notes that climate involves the ongoing exchange of energy and mass between the Earth's surface and the atmosphere, shaping average conditions in a region.

---

In a nutshell, weather is the current state of the atmosphere, measured by temperature, air-pressure, humidity, wind, cloud cover, and precipitation. In contrast, climate refers to the average atmospheric conditions over long periods, such as years or centuries.

**Hydrology**, derived from the Ancient Greek terms for 'water' (húdōr) and 'study of' (-logía), encompasses the scientific examination of water's movement, distribution, and management across Earth and other celestial bodies. This field includes the investigation of the water cycle, the assessment of water resources, and the sustainability of drainage basins.

A glacier is defined as a substantial, perennial mass of crystalline ice, snow, rock, sediment, and often liquid water that forms on land and flows downhill under its weight and the force of gravity.

---

### ***3.4 CLIMATE AND WEATHER PATTERNS: MONSOON, TEMPERATURE, PRECIPITATION***

---

The climate of a region is influenced by its geography and surface features; greater surface diversity leads to more climatic variations. The Himalayan region is the 'largest physical landform on the planet,' featuring diverse landforms that impact the local climate. Key elements contributing to climatic variability include topography, slope degree, glacier proximity, natural vegetation, mountain heights, and range orientation. Consequently, climatic differences are evident at both regional and localized levels. For example, moving north from the Ganges plain to the mountains results in shorter summers, increased rainfall, and harsher winters. Generally, the climatic features of the mountainous region can be classified into two primary factors: seasonal rhythm and vertical zoning.

The Himalayan region features diverse climatic conditions, including subtropical, temperate, and polar climates. Understanding Uttarakhand's climate requires knowledge of the altitude and temperature relationship in the mountains. Blanford notes that temperature generally decreases by about 1°F (-17.2°C) for every 300 feet (91.44 meters) of elevation, though this varies by season and location. In the western Himalayas, January temperatures drop by 3°F (-16.7°C) per 100 feet (30.48 meters), while in the eastern Himalayas, the decrease is only 4°F (-15.6°C) per 100 feet. This trend continues up to about 7000 feet (2133.6 meters). At night,

temperatures in the western Himalayas drop by 1°F (–17.2°C) per 1000 feet (304.8 meters), compared to 2°F (–6.7°C) in the eastern Himalayas. Ozenda suggests a typical temperature decline of 0.55°C for every 100 meters of elevation if the mountain slope and aspect are consistent. The reduction in temperature with altitude significantly affects precipitation levels, with rainfall increasing until a certain elevation, after which it declines. Chimper notes that in mountainous areas, rainfall can be about 3.7 times greater at 1270 meters than in surrounding regions, but drops to one-fifth at around 3000 meters. Hill further explains that cloud cover and humidity lead to greater temperature variations between the coldest and hottest months in interior regions compared to peripheral areas.

The mountainous regions of Uttarakhand, like other Himalayan areas, show notable climatic variations. Located in the central Himalayan zone, it serves as a transition between the eastern and western Himalayas, with intermediate temperatures and precipitation—lower than the east but higher than the west. About 80% of the eastern Himalayas' annual precipitation comes from the summer monsoon, which weakens as it moves westward. The western Himalayas receive both summer and winter precipitation but have lower average rainfall. For instance, Himachal Pradesh witnesses around 250 cm of rainfall in the east, decreasing to 50 cm further west. In the Trans Himalaya region, some areas receive as little as 10 cm annually. Temperature differences are also significant; the western Himalayas have hotter summers and cooler winters, while the eastern region experiences less variation and is influenced by western disturbances in winter.

### **Temperature**

In mountainous areas like Uttarakhand, local topography significantly affects thermal conditions. The southeastern slopes receive more sunlight, resulting in warmer mornings and colder afternoons, while the northern slopes are consistently cold due to less sunlight. On cooler nights, air descends into the valleys, creating lower temperatures, while warmer valley air rises to higher elevations. This temperature inversion typically occurs during calm weather. The region's climate is influenced by its geographical location, the orientation of sunrise and sunset, and physical barriers that influence solar radiation.

To comprehend Uttarakhand's climate, it is essential to consider its vertical topography, as altitude plays a crucial role in influencing temperature. Recent shifts in both physical and cultural factors have modified temperature trends, leading to significant contrasts between the mountainous areas and the interior regions. Daily temperature variations are most pronounced in April and May, while they are minimal in July and August. In winter, temperature changes occur gradually up to 1,600 meters, but this rate increases at higher elevations. Mountainous regions experience a swift decline in temperature compared to the plains, with variations occurring at different rates between 4,000 and 4,300 meters. Table 3.1 illustrates the differences in average temperatures during the winter, summer, and spring seasons at different elevations.

**Table 3.1: Average Temperature Difference At Different Elevations (°C)**

Elevation (m)	January	June	October	Annual Average
1000	12.7	32.0	21.1	22.5
1000-3000	1.5	4.5	3.1	3.3
3000-5000	2.9	4.1	2.9	3.0
5000-7000	1.9	3.7	2.5	3.1
7000-9000	4.6	2.9	2.5	3.3
9000-11000	6.2*	2.6	1.5	2.9
11000-13000	6.2*	2.0	2.3	2.3
13000-15000	7.9*	1.7	1.6	8.5

*Source: After Dr. S. C. Kharkhwal, 2017*

\*Temperature difference below freezing point

Snowfields significantly affect temperature levels, with clear days causing substantial fluctuations due to solar radiation. A 500-meter thick atmospheric layer can see a 20°C drop in 12 hours. In mountainous regions, surface temperatures differ from atmospheric temperatures as soil and rocks absorb or reflect solar heat, leading to variations. Table 3.2 presents the monthly temperature data for several places in Uttarakhand.

Table 3.2 illustrates the temperatures recorded at 14 distinct locations at varying altitudes in Uttarakhand, each characterized by different surface structures. These locations collectively exemplify the climatic diversity, particularly in temperature, found within Uttarakhand. Notably,

Lokpal is located in a high glacial region where temperatures consistently remain below freezing point for all months except August and September.

**Table 3.2: Temperature (°C) of Places Located at Different Altitudes of Uttarakhand**

Place	Altitude (m)	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Avg.
Roorkee	267	20.4	23.5	29.1	35.7	39.2	38.1	33.5	32.4	22.7	31.4	27.1	22.3	38.5
Kichha	293	21.1	24.9	32.0	34.9	39.5	40.6	36.7	32.2	32.8	28.7	26.0	21.9	30.9
Hardwar	314	20.0	22.0	27.0	35.0	36.0	34.0	31.0	30.0	30.0	29.0	26.0	22.0	28.5
Kotdwar	366	12.0	18.0	26.0	30.0	37.0	32.0	29.0	27.0	23.0	19.0	14.0	12.0	23.3
Haldwani	424	13.1	14.1	21.4	25.4	30.5	31.9	30.0	25.4	26.1	25.0	19.6	14.0	23.0
Srinagar	564	12.8	16.3	25.0	28.4	36.2	38.0	20.2	18.4	17.8	16.6	15.0	12.7	21.3
Deharadun	682	11.2	13.7	18.2	21.8	28.0	30.0	27.4	27.3	25.7	22.1	17.2	13.3	21.3
Tehri	770	11.9	14.5	19.2	24.4	28.3	29.8	28.2	28.1	27.0	22.8	17.3	12.6	22.0
Pauri	1643	12.6	17.2	22.0	26.0	32.0	25.0	26.5	24.0	19.0	15.0	5.0	10.0	20.3
Almora	1691	9.5	11.2	15.0	19.8	25.0	24.3	24.9	24.5	21.7	19.9	14.8	10.4	18.4
Pithauragarh	1700	7.7	9.0	13.8	18.2	22.0	23.6	23.3	23.3	22.5	20.2	15.5	8.8	17.4
Nainital	2084	6.0	8.7	12.2	16.7	19.2	20.5	18.7	19.2	18.7	17.6	14.2	8.3	15.2
Mukteshwar	2311	5.9	6.2	10.6	15.1	18.1	18.6	17.6	17.1	16.3	14.1	10.5	7.7	13.2
Lokpal	4328	-11.9	-10.4	-10.3	-9.3	-7.2	-3.4	-3.3	7.0	7.5	-7.0	-7.2	-10.1	-3.5

*Source: After Dr. S. C. Kharkhwal, 2017*

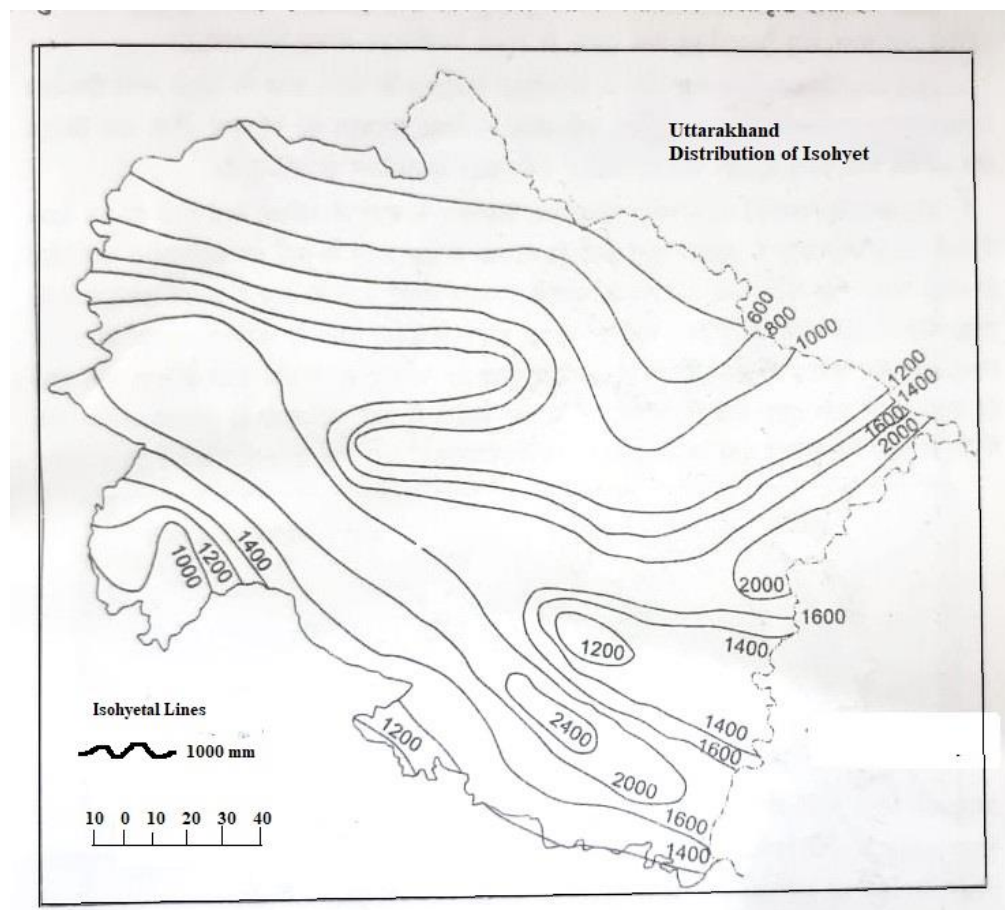
## Precipitation

Precipitation is the main contributor to humidity in any region, including Uttarakhand, where the Himalayan mountain ranges significantly influence the local climate. This mountainous area, located in northern India, affects the climatic conditions of the entire subcontinent and alters air pressure and atmospheric systems. As the southwestern monsoon winds strengthen in late June, they move westward, bringing rainfall from the outer Himalayas. These changes in atmospheric pressure lead to seasonal variations, with air pressure decreasing at higher elevations.

Uttarakhand significantly influences the rainfall dynamics and climatic conditions, particularly in terms of precipitation and temperature, across northern India. The region is predominantly characterized by a monsoon climate, which is responsible for substantial rainfall

driven by monsoonal winds. By the end of June, these winds start to affect the Siwalik mountain range situated in the southern part of Uttarakhand. The Siwalik range serves as a physical barrier, forcing the winds to ascend. This elevation induces a cooling effect through an adiabatic temperature decrease, approximately  $10^{\circ}\text{C}$  for every 1000 meters gained in altitude. As the winds ascend, they reach the condensation threshold, resulting in cloud formation. This phenomenon leads to considerable rainfall in July, especially in areas such as Nainital and the Terai-Bhabar and Doon Valley. However, as the clouds progress northward, their precipitation potential diminishes, leading to lower rainfall in the interior regions. The Terai area typically receives an average annual rainfall of about 2000 mm, while central regions experience between 1000 to 1800 mm. In contrast, the northern areas, particularly Northern Pithoragarh, encounter a marked reduction in rainfall due to their location in a rain shadow zone.

**Fig. 3.1: Isohyetal Lines in Uttarakhand**



Source: After Maithani et al., 2015



The data presented in Figure 3.1 indicates that the northern region of Uttarakhand, particularly within the Garhwal Himalayas characterized by snow-covered terrain, experiences annual precipitation levels below 600 mm. This precipitation predominantly manifests as snowfall. Conversely, as one progresses southward, there is a notable increase in rainfall, with northern Kumaon and north-central Garhwal recording between 800 and 1600 mm of precipitation. Within Kumaon, the northern Almora area and the southern Bageshwar region are identified as having lower rainfall levels. In contrast, the Siwalik mountain range is noted for receiving the highest amounts of rainfall. It is important to note that rainfall diminishes again in the Terai-Bhabar region. Approximately 84% of the annual precipitation in Uttarakhand comes from monsoon rains, with the remaining 16% from other climatic factors. Annual rainfall varies significantly: Roorkee in the Terai region averages 1102.4 mm, Haridwar at the foothills averages 1256.2 mm, and Mukteshwar in the mountains averages 1359.0 mm, with the majority occurring during the monsoon season.

The mountainous areas of Uttarakhand experience precipitation consistently throughout the year. Rainfall may occur intermittently, influenced by monsoon winds or localized disturbances within the interior regions; however, such occurrences are typically brief, leading to ongoing seasonal fluctuations. The diversity in topography results in significant differences in both the quantity and characteristics of rainfall. In addition to elevation above sea level, the geographical location of a place also plays a crucial role in determining rainfall patterns.

**Table 3.3: Rainfall variations and location of the place**

Place	Altitude (m)	Rainfall (cm)	Place	Altitude (m)	Rainfall (cm)
Tehri	770	98	Narendranagar	1080	318
Devprayag	457	102	Kotdwar	396	180
Karnprayag	884	136	Dehradun	682	231
Srinagar	575	93	Rajpur	975	318
Pithauragarh	1636	122	Nainital	1934	270
Almora	1676	104	Lancedown	1845	210
Mukteshwar	2311	136			

*Source: After Dr. S. C. Kharkhwal, 2017*

In Uttarakhand, the orientation of the valleys and the gradient of the slopes significantly influence precipitation levels. The southern slopes tend to receive a greater volume of rainfall, whereas the northern, eastern, and western slopes experience comparatively lower amounts. This variation accounts for the substantial disparity in annual rainfall between Narendra Nagar and Tehri, both situated in the Garhwal Himalayas. Narendra Nagar, positioned on the southern slope of the outer Himalayan range, benefits from the monsoon winds that deliver substantial rainfall, resulting in an average annual precipitation of 318 cm. In contrast, Tehri, now submerged in the water (referred to as Old Tehri), is located in the central region and records an average annual rainfall of only 98 cm. Notably, the peak rainfall across Uttarakhand occurs in July.

S. A. Hill (1876) "Metrology of North-Western Himalayas" notes that temperature variation is greater in inner mountainous regions due to cloud cover and moisture levels. Temperature decreases with altitude, affecting precipitation patterns, which typically increase with elevation up to a point before declining. A.F.W. Simmer's (1903) "Plant Geography" states that at 1270 meters, rainfall is 3.7 times higher than in surrounding areas, but at 3000 meters, it drops to one-fifth.

The Uttarakhand Himalayas receive annual precipitation ranging from 175 cm to 300 cm, with the highest rainfall between Nainital and Mussoorie. The central region sees 100 cm to 200 cm of precipitation, with 15% as snow in winter and 75% as monsoon rain. Rainfall decreases moving northward, with internal valleys receiving 25 cm to 100 cm, 30% as winter snow and 50% as monsoon rain. The Tibet border area gets less than 25 cm, with over 50% as winter snow. The elucidation of the aforementioned statements regarding rainfall distribution is further clarified by Table 3.5, which illustrates the rainfall distribution of the region concerning surface elevation and geographical location.

Table 3.4 shows Uttarakhand's division into six geographical regions and their average monthly rainfall. The Siwalik region receives the most annual precipitation at 2405.2 mm, while the Tibet border region has the lowest at 720 mm. The foothills and Terai plains get more rainfall than the inner Himalayan areas, with a trend of increasing rainfall from the Lesser to the Great Himalayas. Local geography affects this distribution; for example, the central Bhagirathi, Alaknanda, Sarju, and Kali river valleys receive less rain due to being in a rain shadow, while their upper sections benefit from higher precipitation due to exposure to moisture-laden winds.

**Table 3.4: Average Monthly Rainfall (Mm) Across Different Geographical Areas**

Geographical Areas	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Plains	36.6	37.7	14.1	9.8	17.4	214.8	495.9	459.2	248.0	37.8	5.1	14.0	1645.5
Foothills Area	40.9	47.4	20.7	13.2	35.2	223.6	581.6	557.0	263.7	35.9	4.0	16.9	1840.3
Siwalik	63.1	67.0	41.1	33.5	61.3	267.0	732.0	744.9	326.3	37.9	9.1	23.9	2405.2
Middle Himalaya	57.8	60.2	38.1	29.7	64.2	132.8	307.7	316.7	174.0	30.1	7.3	20.8	1126.6
Greater Himalaya	43.4	93.4	119.8	32.2	35.1	94.5	485.7	463.7	168.3	30.1	12.2	27.4	1567.9
Trans-Himalaya	-	-	21.0	3.0	64.0	113.0	95.0	321.0	9.5	8.0	-	-	720.0

*Source: After Dr. S. C. Kharkhwal, 2017*

### Climatic zones

The climate of mountainous areas is significantly influenced by topography and geographical location, leading to greater climatic differences due to increased terrestrial variations. In these regions, micro-climate zones are more important than macro-climate zones. However, establishing these micro-climate zones requires a network of meteorological stations, which is currently insufficient. Empirical calculations based on surface characteristics can help fill this gap. A general approach focusing on altitude rather than spatial differences may be more effective for categorizing climatic zones. Established relationships between temperature, precipitation, and elevation allow for the delineation of climatic zones across the Himalayan region, including Uttarakhand. The specific climatic zones for Uttarakhand are detailed in Table 3.5.

**1.The Sub-Tropical Climate Zone** includes the southern foothills of the Himalayas, covering the Bhabar-Terai region, southern Uttarakhand, Udham Singh Nagar, Haridwar district, and Dehradun valley. Summers are hot, while winters are cold, with average annual temperatures between 18.99°C and 21.1°C. June temperatures range from 27.2 °C to 29.4 °C, and January temperatures from 11.10 °C to 13.30 °C, indicating significant annual variation. Precipitation is moderate, averaging 1645 to 1840 mm annually, with 60 to 70 rainy days per year.

**Table: 3.5: Climatic Zones of Uttarakhand**

S.N	Climatic Zone	Altitude (m)	Average Temperature (°C)		
			January	June	Annual
1	Sub-tropical	Below 900	11.1	27.2	18.9
2	Warm Temperate	900-1800	6.1	21.1	13.9
3	Cool Temperate	1800-2400	2.8	17.2	10.3
4	Cold Climate	2400-3000	1.7	13.3	4.5
5	Alpine	3000-4200	< 0	5.6	3.0
6	Glacial Climate	Above 4200	Below 0° C for 10 months in a year		

*Source: After Maithani et al., 2015*

**2.The Warm Temperate Climate Zone** features a mild climate at altitudes of 900 m to 1800 m, primarily on the lower Himalayan mountain slopes and adjacent river valleys. It includes the southern Siwalik range in Uttarakhand and has average annual temperatures between 13.90 °C and 18.90 °C. In June, temperatures range from 21.10 °C to 27.20 °C, while January sees temperatures between 6.10 °C and 11.1 °C. Summer starts in mid-March, with storms in April and May, and possible afternoon convectional rainfall. Morning fog can temporarily cool the valleys, but temperatures rise with the sun.

**3.The Cool Temperate Climate Zone**, at elevations of 1800 to 2400 meters, has an average annual temperature of 10.3 °C to 13.9 °C. June temperatures range from 17.2 °C to 21.1 °C, while January sees a drop to 2.8 °C to 6.1 °C. The period from late October to November features pleasant weather post-rainy season, contributing to the area's health resorts. Annual precipitation ranges from 1125 mm to 2400 mm, with 61 to 85 rainy days and topographical variations affect rainfall and rainy day frequency.

**4.Cold Climate Zone:** This zone spans altitudes of 2400 m to 3000 m. Winters last about five months with severe conditions, while June to August is milder. Average annual temperatures range from 4.4 °C to 10.3°C, with January lows of 1.7 °C to 2.8°C and June highs of 13.39 °C to 17.2 °C. Rainfall is higher in the mountains, averaging 370 to 500 mm from June to September, while leeward slopes receive 200 to 250 mm. Summer storms and sudden winter temperature drops can lead to snowfall.

**5.Alpine Climate Zone:** This zone includes elevations from 3000 m to 4200 m. Most of Uttarakhand's high mountains experience severe cold for about seven months, with average

temperatures below 6.10°C and January averages below -6°C. Annual temperatures range from 3.0 °C to 4.5°C, and June temperatures are between 5.6 °C and 13.30°C. The high altitude intensifies sunlight, and snowfall can occur even in summer. The region receives an average of 1565 mm of rainfall over about 90 rainy days each year.

**6. Glacial Climate:** Above 4200 meters, the terrain is mostly snow-covered, feeding glaciers that supply lower rivers. For ten months, temperatures stay below freezing, with averages peaking at 6.5°C from July to September and dropping to around -11°C in January. The region receives about 720 mm of annual precipitation. The thin air leads to intense solar radiation, causing snow to melt in sunny areas while shaded regions remain frozen.

---

### ***3.5 HYDROLOGY: RIVERS, LAKES, GLACIERS, AND WATER RESOURCES***

---

The Uttarakhand Himalaya serves as a vital freshwater reservoir, contributing approximately 69% of India's water supply. Water is retained in lakes and snowpacks, which in turn nourish rivers that irrigate the Ganga plains. The state boasts substantial water reserves and a diverse array of rivers including smaller streams, referred to as Gad, Gadhera, Raula and Baula.

#### **Rivers**

Uttarakhand is rich in rivers, primarily due to its northern glaciers that melt and feed numerous perennial rivers. Major rivers include the Ganga, Yamuna, Bhagirathi, Alaknanda, Kosi, Mandakini, Kali, Gori-Ganga, Ramganga, and Pindar, along with their tributaries. The state's rugged landscape and towering peaks are the sources of some of India's most revered rivers, which hold significant cultural and historical importance. Notably, the sacred Ganga and Yamuna traverse Uttarakhand, enhancing its spiritual significance. The region also serves as a confluence for various rivers, nourished by glaciers in the Western Himalayas. The rivers of Uttarakhand can be classified into four primary river systems according to the region's topography.

#### **1. Bhagirathi-Alaknanda River System**

A large part of Uttarakhand lies within the Bhagirathi-Alaknanda basin, which covers almost the entire Garhwal Himalaya, except for the western part of the Uttarkashi district and the

---

northwestern areas of Bageshwar and Pithoragarh, which belong to the Kumaon Himalaya. The Bhagirathi and Alaknanda rivers originate from the western and eastern slopes of Chaukhamba (7138 m), respectively. These two rivers meet at Devprayag, where they receive water from the entire Garhwal region. After Devprayag, the river is known as the Ganga. The Alaknanda starts at the Alakapuri glacier, and the Saraswati River merges with it near Mana village, north of Badrinath. The Dhauliganga, a major western tributary, begins at Kunlung in the Niti region and joins the Alaknanda at Vishnuprayag, fed by two main tributaries: the Girithi Ganga, which flows from the northwest of Pithoragarh, and the Rishi Ganga, originating from Nanda Devi (7,817 m). From Vishnuprayag to Pakhi, the Alaknanda flows through a narrow, steep valley.

The Birahi Ganga, a tributary of the Alaknanda River, is known for its small size and history of destructive floods. It originates from the Ghunti mountain and joins the Alaknanda at Birahi. The river once flowed through a lake created by sediment accumulation, which was lost in the 1970 flood. Another key tributary, the Nandakini, flows about 57 km from the Trishul mountain to Nandprayag, receiving several tributaries, including the Roop Ganga, which starts at Roopkund. Among the left-bank tributaries of the Alaknanda, the Pindar River holds particular importance. The Pindar River, originating from the Pindari Himani in Bageshwar, flows southwest to meet the Alaknanda near Karnaprayag, while the Aataagad River joins the Pindar near Simli.

Mandakini represents the most significant tributary on the right bank of the Alaknanda River. It originates from the Kedar Glacier. The Madhuganga, a tributary located in the upper reaches, originates from the vicinity of Madmaheshwar and converges with the Mandakini near Kalimath. Throughout its course, Mandakini predominantly flows in a north-south orientation, traversing the central region of Rudraprayag district, before ultimately merging with the Alaknanda River in Rudraprayag. Subsequently, the Alaknanda River continues its journey in an east-west direction, passing through Srinagar and Kirtinagar, before joining the Bhagirathi River at Devprayag.

The Bhagirathi sub-river system primarily encompasses the Uttarkashi district, except for northwestern regions, as well as the entirety of the Tehri district. The Bhagirathi River starts at Gomukh and flows west for about 18 kilometres before merging with the Jahnavi River in Bhairon Ghati. After this confluence, it continues east-west until Purga, then shifts to a north-

south direction until Bhatwadi. The Jahnvi River, also known as Jad Ganga, is nearly twice as long as Bhagirathi before their junction. Its main source is at Sumer near Thamlam Pass, with tributaries like Barigan Gad and Chor Gad. Between Bhatwadi and Uttarkashi, Bhagirathi flows east-west for about 35 kilometres before changing direction multiple times and merging with the Alaknanda River at Devprayag. Key tributaries of Bhagirathi between Harsil and Maneri include Jalandhri Gad, Siya Gad, and Pilang Gad, with others like Dhaneri Gad, Nagun Gad, and Jalkur joining between Dunda and Tehri.

The Bhilangana River serves as the sole significant tributary of the Bhagirathi River, originating from Bharti Kantha, located in the northeastern part of the Tehri district. It converges with the Bhagirathi at Ganeshprayag, the old Tehri. The Balganga, also referred to as the Balkhila River, constitutes the primary tributary of the Bhilangana, beginning its course at Sahasnatal in the north and joining the Bhilangana near Pilkhi. Additional tributaries contributing to the Bhilangana include the Dharam Ganga, Chanji Gad, and Belbari Gad, among others.

The Ganga River is formed at Devprayag by the convergence of the Bhagirathi and Alaknanda rivers, making the Bhagirathi-Alaknanda basin part of the Ganga's hydrological system. In the upper Ganga basin, primarily in the Garhwal Himalayas, Alaknanda is considered the main river due to its greater length, larger catchment area, and higher water availability. At Devprayag, the Bhagirathi flows in rapidly from the north, while Alaknanda approaches more gently from the east, with its riverbed at a lower elevation, indicating that Bhagirathi is geologically younger. Despite this, the source of the Ganga is traditionally recognized as Gomukh, linked to longstanding religious beliefs.

The Nayar sub-system is a vital part of the Ganga flow system in Uttarakhand, comprising the waters collected from both the Western and Eastern Nayar rivers. A large area of the Pauri Garhwal district is included in this sub-system. Both rivers originate from the Dudhatoli mountain range. The Western Nayar initially flows northward from its source but soon veers approximately 77 kilometres to the west and southwest, eventually meeting the Eastern Nayar at Bhatkoli, near Santpuli. In contrast, the Eastern Nayar flows southwest from its source until it reaches Kainyur, near Thalishain, where it suddenly changes direction to the west and northwest, following the southern boundary of Khatli Patti before joining the Western Nayar



after travelling about 93 kilometres. At Satpuli, the two rivers merge to form the Nayar River, which then flows northwest for around 32 kilometres before emptying into the Ganga River at Vyasghat. The upper part of the Nayar Valley is densely populated due to its wide and open terrain, while the lower valley remains sparsely inhabited, nestled between steep mountain slopes.

## **2. Yamuna River System**

The Yamuna River originates from the Yamunotri glacier, specifically in the Bandarpoonch area. From a religious standpoint, its source is considered to be the thermal spring near the Yamunotri temple. The river flows southwest for about 150 kilometres until it reaches Banog, after which it enters the Doon Valley. One of its main tributaries is the Tons River, which originates on the northern slope of the 3,896-meter-high Bandarpoonch mountain and flows southward. After travelling 160 kilometres, it merges with the Yamuna at a place called Kalsi, significantly increasing the Yamuna's water volume due to the Tons' substantial flow. The Pabar River, which starts in Himachal Pradesh, also feeds into the Tons River.

The Giri and Bata rivers, originating in Himachal Pradesh, join the Yamuna near Ponta, contributing to a catchment area of 2,320 square kilometres within the Yamuna watershed. In the Doon Valley, several rivers, including the significant Asan River, flow into the Yamuna. This river starts on the western side of the Asarori-Dehra road at an elevation of 610 meters and flows northwest for approximately 42 kilometres, eventually joining the Yamuna near Rampur Mandi. The Tongsad River is the main tributary of the Asan River, originating from the hills of Mussoorie.

As the Yamuna cuts through the Siwalik range near Badshahi Mahal in Haridwar, it shapes the landscape through erosion, creating a distinctive topography in western Garhwal.

## **3. Ramganga River System**

The Ramganga flow system spans Kumaon and Garhwal, with the river and its tributaries—Kosi, Gaula, Bino, and Gagas—traversing eastern Garhwal and the Nainital and Almora districts of Kumaon. This network channels water from the Kumaon Himalayas to the Garhwal Himalayas and into the plains. The Ramganga River originates from Doodhatoli mountain's eastern slope, initially flowing southeast before shifting southwest. The Bino tributary joins near Deghat, and the river continues southeast for about 15 kilometres before merging with the Gagas River at Bhikiyasen. It flows southwest through a broad valley between



Ganai and Chaukhutia, eventually crossing the Siwalik range near Kalagarh. The river's zigzag course integrates various tributaries, with the Bino and Gagas significantly contributing to its flow.

The Kosi River, another key tributary, originates from Dharpani Dhar at 2500 meters, flowing southeast to Ranaman village and then south to Havalbag, where it supports extensive agriculture. Beyond Havalbag, it shifts westward through a narrow valley, fed by smaller tributaries like Devgad, Minolgad, and Sumarigad, and encircles Sahyadevi mountain, marking the northern boundary of Nainital district.

#### **4. Kali River System**

The Kali River originates from the confluence of the Kalapani and Kuthi Yankti rivers in Uttarakhand's Pithoragarh district. It is fed by numerous springs and flows from the snowy Great Himalayas, where the Kuthi Yankti receives water from smaller rivers before reaching the plains near Tanakpur, where it becomes the Sharda and eventually the Ghaghara River.

The main tributary of the Kali River is the Dhauli Ganga, which splits into the Darma and Lissar branches at Tijang (3250 meters). The Dhauli Ganga flows rapidly, featuring waterfalls and rapids, and collects water from smaller streams before joining the Kali River near Khela. Notable tributaries include Nandarma, Kunchutich, Selayankti, and Naglingyankti.

Gori Ganga, a major tributary of the Kali River, originates from the Bamlas Glacier and splits into two branches near Lilam, flowing southeast with a steep gradient. It has a higher volume and velocity than other rivers, experiencing erosion along its course. At times, it disappears under ice formations before reemerging. Gori Ganga collects water from various tributaries and shapes diverse landscapes before joining the Kali River near Jauljivi. Key tributaries include Gonkaghad, Jimbaghera, Madkanigad, and Ralamgad.

The Saryu River, a tributary of the Kali River, originates from the Pindari glacier at Sarmul and flows southeast to join the Kali at Pancheshwar. It meets the Gomti River at Bageshwar, which starts at Debra and flows through Baijnath. The Saryu created a fertile valley that supported the ancient Katyur dynasty. Another tributary, the Panar River, begins at the Nainital-Almora border and merges with the Saryu near Rameshwar, contributing water from its

tributaries. The Ladhiya River, also a tributary of the Kali, flows from Gajar and joins the Saryu near Chuka.

**Table 3.6: Major Rivers of Uttarakhand**

River	From	To	Length (km)
Kali	Lipulekh	Tanakpur	252
Bhagirathi	Gaumukh	Devprayag	205
Bhilangna	Khatling	Tehri	110
Alaknanda	Satopanth	Devprayag	195
Kosi	Kausani	Sultanpur	168
Ramganga (western)	Dhoodhatoli	Kalagarh	155
Tons	Rupin-Supin (Glacier)	Dak Patthar	148
Saryu	Surmool	Pancheshwar	146
Yamuna	Yamonotri	Dhalipur	136
Ramganga (Eastern)	Ponting Glacier	Ramehswar	108
Pindar	Pindari Glacier	Karnprayag	105
Gauri	Milan Himrali	Jauljivi	104
Gaula	Paharpani	Kichha	102
Dhaulti (garhwal)	Devvan Himani	Vishnuprayag	94
Dhaulti (kumaun)	Gewan Khana Himani	Tawadhar	91
Nayar (eastern)	Doodhatoli	Satpuli	109
Nayar (Western)	Doodhatoli	Satpuli	78
Mandakini	Kedarnath	Rudraprayag	72
Ganga	Devprayag	Haridwar	96
Nandakini	Nanda Ghungati	Nandprayag	56
Kuti	Lapiyadhura	Kali	54
Ladhiya	Thali	Chooka	52
Lehawati	Aibarmount	Kali	48

*Source: After Maithani et.al., 2015*

## Lakes

The Uttarakhand Himalaya is home to several renowned lakes that hold significant local value and attract numerous tourists, thereby contributing to the region's economic vitality. Numerous natural lakes have emerged in the elevated mountainous areas of the Garhwal Himalaya, predominantly as glacial formations. Additionally, some lakes have resulted from landslides, while others have disappeared due to river erosion. Some lakes have been artificially created for economic purposes. Notable high-altitude lakes include Durital, Dodital (3,024 m), Roopkund (4,778 m), Hemkund (4,329 m), Basukital, and Chorabadital, with many located in dense forests. Hemkund Sahib is a key pilgrimage site for Sikhs, surrounded by seven snow-

capped peaks. Roopkund, known as the "Mystery Lake," is famous for its burial sites containing human and equine remains, highlighting the region's historical significance.

**Table No. 3.7: Lakes in Uttarakhand**

Lakes	Location
Vishnugal	Near Satopanth Badrinath
Satopanth	Fountain head of Alaknanda
Roopkund	Near Vedani Bugyal
Benital	At the hill of Adibadri
Sukhtal	Near Ghat
Jhaltal	Near Sukhtal
Vasuki Tal	Near Kedarnath
Dugdha Tal	Dudhatoli
Kansaro Tal	Near Raiwala railway station
Chandbarhi Tal	Originating place of Chandrabhaga River (Dehradun)
Manibhadra Sarovar	To the east from Birahi river
Bindu/Venu Sarovar	Originating part of Bindumati Dhara
Divya Sarovar	Originating place of Venumati (Nainital)
Nainital (Rishi Sarovar)	Nainital
Chaurabarhi Tal	Near Kedarnath
Bhimtal	Nainital
Birahi Tal	Birahi Ganga
Naukuchhiyatal	Nainital
Devarya Tal	Near Ukhimath
Sat Tal	Nainital
Bhenkal Tal	Badhan
Khurpatal	Nainital
Masar Tal (Brother-Sister Tal)	Budha Kedar (Tehri)
Survadi Tal (Chaurabarhi)	Chamoli
Yamala Tal	Champawat
Sahasratal	Tehri (Ghuttu)
Achari Tal	Amid the Valley of flowers
Thalang Tal	Amid the Valley of flowers
Tarhag Tal	Almora
Yamtal	Near Sahasra Tal
Sartal	Uttarkashi
Dodital	Near Gangotri
Kedar Tal	Uttarkashi
Kana Tal	Behind Dodital
Lokpal (Hemkund)	Chamoli
Nachiketa Tal	Between the pahcan village and kold village of Dhanari
Drona Sagar Pond	2 km away from Kashipur
Nal Damyantu Pond	3 km from Mehara Village (Sat tal)

Source: After Maithani et.al., 2015

The Kumaon Himalayas lack prominent lakes in the higher mountainous regions, but the Nainital district in the Lesser Himalayas is known as the "Lake region of Kumaon," featuring a concentration of lakes over an area of about 25 km by 4 km. Notable lakes include Nainital (also known as Rishi Sarovar), Bhimtal (largest lake in the Nainital District), Naukuchiatal, Sattal, Poonatal, and Nal-Damayantital, along with others like Khurpatal and Sukhatal. Historically, there were around 60 lakes in this area, known as Chhakhata Parghana. While the region doesn't have large lakes like those in the Garhwal Himalayas, it does include several natural lakes in Pithoragarh, such as Chota Mansarovar, Thamorital, and Gangpani Tal, as well as Shyamala Tal near Sukhidhang in the Champawat district.

## Glaciers

In high-altitude mountainous regions, adequate snow accumulation allows the snow or ice mass to gradually move over the ground beneath it due to its weight; this accumulation is called a glacier. The downward flow of this snow mass is particularly evident in areas with high annual snowfall. The movement of glaciers generally accelerates as they continue to gather debris and the added weight from fresh snowfall. Consequently, glaciers are often described as "rivers of ice." Research estimates suggest that there are approximately 15,000 glaciers of various shapes and sizes in the Himalayan region. In the Uttarakhand Himalaya specifically, studies indicate there are around 917 glaciers of different sizes, with about 30 of them considered significant. Below is a list of the primary glaciers.

**Table 3.8. Main Glaciers of Uttarkhand**

<b>Name of Glaciers</b>	<b>District</b>
Milam Glacier, Kali Glacier, Namik Glacier, Hiramani Glacier, Pinaura Glacier, Ralam Glacier and Ponting Glacier	Pithauragarh
Sunderdhungi Glacier, Sukh Ram Glacier, Pindari Glacier, Kafani Glacier and Maiktoli Glacier	Bageshwar
Yamunotri Glacier, Gangotri Glacier, Bandarpoonchh Glacier and Doriyani Glacier	Uttarkashi
Khatling Glacier	Tehri
Chaurabarhi Glacier and Kedarnath Glacier	Rudraprayag
Dunagiri Glacier, Badrinath Glacier, Hiprabamak Glacier, Santopath and Bhagirathi Glacier	Chamoli

*Source: Prepared by Author*

---

### 3.6 SUMMARY

---

Uttarakhand, located on the southern slopes of the Himalayas, features a diverse climate that ranges from subtropical forests at lower elevations to glaciers at higher altitudes (200 to 7,817 meters). The southern regions have a hot and humid subtropical climate, while the north experiences a cold alpine climate, with temperate conditions in between. The climate is influenced by altitude, latitude, and topography, making high-altitude areas largely inaccessible in winter due to severe cold and heavy snowfall. The state has four seasons: winter (December to February), pre-monsoon (March to May), southwest monsoon (June to September), and post-monsoon (October to November). Winter temperatures range from 5 °C to 20 °C, with higher elevations often below zero. Pre-monsoon temperatures peak at 34-38 °C in May to mid-June. The southwest monsoon brings an average annual rainfall of 133 cm over about 63 days, primarily from monsoon depressions in the Bay of Bengal, with variations due to topography. Rivers in Uttarakhand are vital for religious practices, tourism, dam construction, trekking, irrigation, and glacial activity, serving as sacred lifelines for the region. Protecting these resources is essential for future generations. Additionally, Uttarakhand is famous for its stunning natural lakes, particularly in the Kumaon region, formed by tectonic processes.

---

### 3.7 GLOSSARY

---

- **Climate:** The long-term patterns and averages of weather conditions in a particular region, encompassing factors such as temperature, humidity, precipitation, and wind.
- **Weather:** Weather refers to the atmospheric conditions in a specific area at a given time. It reflects the short-term state of the atmosphere, which can change rapidly.
- **Climatology:** Climatology is the scientific study of climate, focusing on long-term weather patterns, their variations, and the interactions between the atmosphere, oceans, and land, including the effects of human activities on climate systems.
- **Water resources:** Natural resources that include surface water, groundwater, and precipitation, and are essential for human survival, agriculture, and industry.
- **Hydrology:** Hydrology is the scientific study of water's distribution, movement, and properties in the Earth's atmosphere and on its surface, including the water cycle, water resources, and environmental interactions.

- **Monsoon:** The monsoon is a seasonal weather phenomenon marked by significant changes in precipitation due to shifting wind patterns and atmospheric pressure.
- **Landforms:** Landforms are natural features of the Earth's surface, such as mountains, valleys, plateaus, hills, and plains, shaped by geological processes like tectonic activity, erosion, and sedimentation.
- **Atmosphere:** The "atmosphere" is the layer of gases surrounding a celestial body, like Earth, held by gravity. It is essential for supporting life, regulating temperature, and enabling weather phenomena.
- **Natural Vegetation:** Natural vegetation is the plant life that grows in a region without human intervention, shaped by local climate, soil, and environmental factors, creating distinct ecosystems.
- **Temperature:** Temperature is a measure of the average kinetic energy of the particles in a substance, reflecting the degree of thermal energy present.
- **Precipitation:** Precipitation is any form of water, liquid or solid, that falls from the atmosphere to the Earth's surface, including rain, snow, sleet, and hail, and is vital to the hydrological cycle.
- **Temperature Inversion:** Temperature inversion is a meteorological phenomenon where the normal temperature gradient is reversed, with warmer air above cooler air. This prevents the cooler air from rising and can lead to effects like pollutant accumulation and fog formation.

---

### 3.8 ANSWER TO CHECK YOUR PROGRESS

---

1. Bhilangna River of Uttarakhand is the tributary river of ?

- a. Alaknanda
- b. Bhagirathi
- c. Pindar
- d. Nayar

Answer: b.

**2. Gori Ganga originates from which glacier ?**

- a. Pindari Glacier
- b. Kafni Glacier
- c. Bamlas Glacier
- d. Khatling Glacier

**Answer: c.**

**3. Which district in Uttarakhand is known as the Lake Region of Kumaun ?**

- a. Almora
- b. Nainital
- c. Pithauragarh
- d. Bageshwar

**Answer: b.**

**4. Which lake in Uttarakhand is surrounded by seven snow-capped peaks?**

- a. Hemkund
- b. Roopkund
- c. Nachiketa Tal
- d. Yamtal

**Answer: a.**

**5. What percentage of the annual precipitation in Uttarakhand is attributed to monsoon rainfall?**

- a. 90 percent

- b. 84 percent
- c. 74 percent
- d. 80 percent

**Answer: b.**

**6. Which geographical region of Uttarakhand experiences the highest annual precipitation?**

- a. Greater Himalaya
- b. Middle Himalaya
- c. Siwalik
- d. Trans himalaya

**Answer: c.**

**7. Which river is known for its history of destructive flooding?**

- a. Kali
- b. Birahi Ganga
- c. Tons
- d. kosi

**Answer: b.**

**8. Which river is referred to as the Balkhila River?**

- a. Madhuganga
- b. Balganga
- c. Jad Ganga
- d. Ramganga



**Answer: b.**

**9. Largest lake of the Nainital District is-**

- a. Bhimtal
- b. Sat Tal
- c. Naukuchhiyatal
- d. Nainital

**Answer: a.**

**10 . Which lake is referred to as the brother-sister tals?**

- a. Masar Tal
- b. Yam Tal
- c. Venital
- d. Badani Tal

**Answer: a.**

---

### **3.9 REFERENCES**

- <https://unacademy.com/content/railway-exam/study-material/general-awareness/list-of-rivers-of-uttarakhand/>
- <https://ghughuti.org/rivers-in-uttarakhand/>
- Kharkwal, S. C. (2017). Uttarakhand A Geographical Analysis of Physical, Cultural & Economic Scenario (in Hindi), WinsarPublication,PP. 37-83
- Kharkwal, S. (2001). Garhwal Himalaya (Nature, Culture & Society). Srinagar Garhwal : Transmedia Publication House.
- Maithani, D. D., Prasad, G. and Nautiyal, R. (2010). Geography of Uttarakhand (in Hindi), Sharda Pustak Bhawan, Allahabad. PP. 36-68.
- Uttarakhand Dev Bhumi Blog. (2012). <http://uttarakhanddevbhumi.blogspot.com/>

- Kaushik, S.D. (1959). Climate Zone and Their related socio-economy in Garhwal Himalaya. Geographical Review,24(2-3):29.
- 

### ***3.10 TERMINAL QUESTIONS***

---

1. Describe the nature of rainfall in Uttarkhand.
2. Describe the climate of Uttarakhand.
3. How many climatic zones can Uttarakhand be divided into? Kindly provide a detailed description of each climatic zone
4. Explain the Bhagirathi-Alaknanda River system.
5. Provide a comprehensive overview of the significant lakes located in Uttarakhand.
6. Explain the Kali River system.
7. Explain the Yamuna River system.

---

**UNIT-4      ECO-SYSTEM      DIVERSITY      FORESTS,  
GRASSLANDS,      WETLANDS,      WILDLIFE      AND  
CONSERVATION AREAS, NATURAL PARKS, WILDLIFE  
SANCTUARIES,      THREATS      TO      BIODIVERSITY  
DEFORESTATION, HABITAT LOSS, HUMAN-WILDLIFE  
CONFLICT**

---

**4.1 OBJECTIVES**

**4.2 INTRODUCTION**

**4.3      ECO-SYSTEM      DIVERSITY      FORESTS,      GRASSLANDS,  
WETLANDS,      WILDLIFE      AND      CONSERVATION      AREAS,  
NATURAL PARKS, WILDLIFE SANCTUARIES, THREATS TO  
BIODIVERSITY DEFORESTATION, HABITAT LOSS, HUMAN-  
WILDLIFE CONFLICT**

**4.4 SUMMARY**

**4.5 GLOSSARY**

**4.6 ANSWER TO CHECK YOUR PROGRESS**

**4.7 REFERENCES**

**4.8 TERMINAL QUESTIONS**

---

## **4.1 OBJECTIVES**

---

- To understand ecosystem diversity.
- To make learners aware of the grasslands of Uttarakhand and their uniqueness.
- To make the importance of wetlands known.
- To do a detailed study of wildlife parks and sanctuaries of Uttarakhand.
- To identify the causes of biodiversity threats, deforestation and Human-wildlife conflicts.

---

## **4.2 INTRODUCTION**

---

The state of Uttarakhand is considered to be a prosperous state in terms of the ecological characteristics that it has acquired as its geographical heritage. On one hand, natural resources spread their natural beauty. On the other hand, spiritual places and traditions have given it a unique identity, based on which it has been named Devbhoomi. The natural beauty, biodiversity and environmental wealth of the state of Uttarakhand and the ecological diversity of the region imbibe unique characteristics; hence, in the form of ecology, dense diverse forests, grasslands, wetlands, wildlife and protected areas provide global status to the state. In forest ecology, groves present the most beautiful natural scenery. Broad-leaved forests, deciduous forests and high alpine forests provide livelihood to the residents along with environmental balance. The Bugyals situated in the state, besides having an important place in the biodiversity of this place, is also a museum of herbs because these herbs are found only in selected places of the world, which includes the state of Uttarakhand.

In the ecosystem, the state provides shelter to migratory birds and wild animals. Even though most of the state is mountainous, wetlands are also found here as a gift of nature, which are very important terrestrial parts for wetwater sources and biodiversity. In the fauna category, many species of animals of the world are found here, which is not possible in other areas of the world, but these features or diversities are found in abundance in the state of Uttarakhand, like the Valley of Flowers, the natural area with the highest number of flowers in the world, is found here. Similarly, other biological and non-biological features of the state also preserve national and international heritage here for the protection of many types of life. At present, 6 wild national parks, 7 national forest sanctuaries and 4 conservation reserve areas have been established near the state, as a result of which special

species of flora and fauna are found here in the state, as a result of which at present the state has been included in the major tiger states of the country and is also contributing to environmental balance at the global level.

Therefore, to understand the ecosystem diversity of Uttarakhand in detail, there is a need for an in-depth analysis of the physical and environmental features of the state and to work on the policies of sustainable development, because the past developmental activities have affected the natural and economic system of the state. Has been affected due to which the residents here have to face many types of ecological dangers every year. Due to excessive human intervention in the biodiversity of Uttarakhand, deforestation, forest fire and agricultural expansion have increased human-wildlife conflicts in the last two to three decades, due to which hundreds of people have been killed by wild animals. Apart from this, urbanization and changes in the elements of climate have given rise to many types of threats to the biodiversity of the state, due to which the ecosystem is suffering heavy losses. While the bio-richness here covers 65 percent of the area with forest cover and has been contributing to the growth of rare and endangered species for a long time. Along with being an integral part of the Himalayan ecology, the state also plays an important role in controlling the local climate. Due to the diversity of climate, botanical diversity is rich here, which strengthens the possibilities of natural tourism, which attracts tourists from the country and the world, due to which lakhs of tourists come here every year for tourism and health benefits and contribute to the local economy. Jim Corbett, the country's first national park, is currently the main centre for tiger conservation and is also providing guidance for tiger conservation in the world.

Apart from this, the Nanda Devi Biosphere, which is protected by UNESCO World Heritage, is also located in the state. Thus, for the protection of the bio-wealth of Uttarakhand state, the need to emphasize environmental education and sustainable development like eco-tourism is assessed from the present and future point of view, because on one hand environmental awareness inspires to understand and protect the environment, on the other hand, tourism development has the potential to increase the local economy and also protect the environment by common humanity. Therefore, the diversity of the ecosystem of Uttarakhand not only represents natural wealth but is also very important for human life and culture. Collective efforts are required for its conservation so that the coming generations can also get the benefit of the natural heritage of the state, and environmental degradation can also be controlled.

---

### 4.3 ECO-SYSTEM DIVERSITY, FORESTS, GRASSLANDS, WETLAND, WILDLIFE AND CONSERVATION AREAS, NATURAL PARKS, WILDLIFE SANCTUARIES, THREATS TO BIODIVERSITY DEFORESTATION, HABITAT LOSS, HUMAN-WILDLIFE CONFLICT

---

#### **Eco-system Diversity in Uttarakhand-**

**Biodiversity in Uttarakhand-** The geographical structure and Himalayan position of Uttarakhand provide richness to biodiversity. While the physical disparity in the northern part produces biodiversity with snow-covered polar characteristics and assimilates complex environmental conditions, in which limited species of animals and plants show different biodiversity, the middle higher parts have temperate climate characteristics and being the origin place of rivers, many river valleys have been formed, with the help of which many types of diverse flora and fauna reside. This region is going to assimilate the characteristics of both the high and middle Himalayas. Under biodiversity, broad conical trees are found more here, the decrease or transfer of the number of animals due to snow cover in winter gives a special identity to this region. In summer, when the snow melts, many types of small grasses grow and small grasslands like Bugyal are born here, which, being soft grass, attract tourists with beautiful natural scenery, as well as provide animal fodder to seasonal shepherds and sheep herders, also give a unique form to summer biodiversity in the middle Himalayan region and this geographical region gets a unique natural creation of biodiversity in the world.

The Shivalik ranges located in the south of the middle Himalayas are the densest biodiversity area in the world in terms of biodiversity. The temperate climate has been providing habitat to many types of flora and fauna at an altitude of **800 to 1200** meters in the entire Himalayas for a long time. Almost all the plants found in Uttarakhand present a unique example of biodiversity here. The southern parts of Shivalik, Doon-Dwar valleys, Bhawar and Terai regions are plains characterized by a unique climate. Where many types of animals are found, which is a residential area with optimum natural and human diversity for micro to giant organisms, while the vegetation cover is less rich than the Shivalik region. Being a plain area, this area is the highest multi-purpose land from the point of view of biodiversity development and human use, where all the climatic and physical conditions have been optimum for artificial biodiversity development.

In this way, biodiversity is the invaluable treasure of Uttarakhand and it is a state rich in terms of fauna and flora and holds a special place in India with dense biodiversity, as well as provides prosperity to the state in the field of biodiversity in which the number of organisms is dense, whereas, in other Himalayan regions, this diversity is in a rare state. In reality, the diverse physical conditions, structure, climatic conditions and vegetation and fauna population of Uttarakhand give a unique form to biodiversity. According to the Uttarakhand Forest Research Institute, **1943** plant species are found here, out of which about **56** are sensitive and are in a state of extinction and **4000** species are in protected shelter. Out of these **161** species are currently endangered, which have been declared rare by the International Union for Conservation of Nature.

In terms of fauna and species diversity, there are about **102** species of mammals, **623** types of avifauna, **124** types of fish, **19** types of amphibians and **69** types of carnivores. Due to human cultural intervention, some special species of the biodiversity-rich state are becoming extinct, the major ones being Asian elephant, snow leopard, tiger, musk deer, Himalayan monal, king cobra and buffalo. According to the Flora and Fauna Census **2023**, **3167** tigers have been found here, which is in third place after Madhya Pradesh and Karnataka. Apart from this, many microscopic organisms are found here. Distribution of Biodiversity in Uttarakhand

The distribution of biodiversity in Uttarakhand is mainly divided into four parts based on the characteristics of physical structure and climatic elements.

### 1) **Biodiversity Rich Region**

This region is spread from the plain area to the height of about **1200** meters (Shivalik Himalayan region), which mainly includes the Bhabar region and the slopes of the Shivalik Himalayan, in which many types of vegetation and rich habitats of wildlife are found, due to which it has been included in the protected major biodiversity areas of India. Along with this, the tall and dense trees of the plain and Terai region and the habitats of huge animals give it a speciality, in which the wildlife species mainly include lion, elephant, deer, cheetah, chital, tiger, leopard, Nilgai, wild boar, bear, sambhar, monkey, langur, thar, ghurda along with hundreds of birds are found here. Apart from fauna, many types of medicinal species (Anantmool, Satavari, Giloy, Paniya, Van Tulsi, Ginger, Bay leaf, Mentha and Bhang) are mainly found.

## **2) Area with Normal Biodiversity**

This geographical region is from 1200 meters of Shivalik Himalayas to 3000 meters of middle Himalayas, in which some special species of broad-leafed plants like pine, deodar, bazaar, rhododendron, kafal and other species of animals and many types of birds including bear, deer, peacock, spotted deer, tiger, monkey, langur reside here. Biodiversity decreases with the increase in height and this area is of normal status from the viewpoint of biodiversity. In terms of medicinal plant diversity, saffron, glorium, tea, chiraita, vajradanti, kachri dhatura and reetha are mainly found here.

## **3) Area with Rare Biodiversity**

This biodiversity area is present at an altitude of 3000 to 4600 meters. Most of its parts remain covered with snow in winter and the temperature sometimes remains below the freezing point, due to which the fauna and flora are not able to develop fully nor do they get enough sunlight to grow. Summer is a suitable time for the growth of small grasses. In some places, small bushes also grow for a limited time, due to which many types of animals start migrating here seasonally. The migratory animals mainly include bears, monkeys, musk deer and snow leopard. The most important feature of this area is that the bioecological productivity here is very low. 4) Biodiversity-less areas

Biodiversity-less areas include areas with an altitude of more than 4600 meters where a harsh cold desert climate is found, the temperature here is always negative, rainfall occurs in the form of snow, most of the high mountains are always covered with snow, where the growth of any kind of grass, vegetation and fauna is not possible, but this area is considered to be rich in terms of water resources.

## **Forests and grasslands of Uttarakhand-**

Based on the forest area and characteristics of the forests of Uttarakhand, it is included in the major forested states of India, as a result of which the state is given a special green bonus every year by the Government of India. The dense forests of the state of Uttarakhand provide more prosperity to the forests through various types of vegetation, grasses and fauna. Alpine, evergreen, deciduous and monsoon forests and many species of soft grasses are found in the Uttarakhand Himalayan region. Many mixed types of vegetation are found in 45.44 percent of the total forest area of 24,295 sq km of the state. Which presents an ideal sample of biodiversity (from small bushes to trees of 30-40 meters in height). Since most of the state is located in the lap of the Himalayas, climatic diversities



are found in every physical division, as a result of which botanical diversity is seen in the forests, which is directly proved by the species of forests found in the state. Along with botanical diversity, faunal diversity is also found on a large scale in the forests. Due to these characteristics, despite being a small state, there are a large number of national parks, sanctuaries, wildlife reserves and other biosphere reserves for forest and wildlife wealth and at present the forests of the state are acting as a fund for the state economically because wildlife tourism and natural tourism is flourishing on a large scale in the state, for which conservation of forests is becoming very important. Apart from this, forests are also making an invaluable contribution to the climate and weather of the state. Thus, many species of different types of plants, grasses, parasites, creepers, and shrubs are found in the state, in which details of major forest species have been made clear in Table number (4.1).

**Table No. 4.1: Uttarakhand State Forest Species 2017-18**

Species	Boitnical Name	Species Local name	Boitnical Name	Species Local name	Boitnical Name
Local Name	Juglans regia	Cedar	Cedrus deodara	Castor	Ricinus commuais
Walnut	Fraxinus Micrantha	Dhaman	Cenchrus	Kandali	Ustica
Angu	ficus polmata	Dhauila	Woodfordia	Oleander	Cascabella Thevetia
Bedu	Spondias pinata	Pear	Pyrus lommunis	Saturday	Daphne papyracea
Amdha	Cassia fistula	Hill Pipal	Piper mullesua	Salam Mishri	Pachyrhizus
Amaltas	Lyonia Ovalifolia	Padal	leptodermis	Kukurdana	Smilax aspera
Ayar	Mangifera Indica	Pangar	Aesculus	Liptis	Eucalyptus
Mango	Emblica officinalis	Papdi	Buxus	Satavar	Asporagus racemosus
Amla	Alnus nepalensis	Rai Jamun	Cleisfocalyx	Kapoor Kachri	Hedychium spicatum
Uttis	Picrasma quassioides	Putli	Caspinus	Kamini	Muya
Kakra	Flaco urtia	Faldu	Mitragyna	Kala Hisalu	Rubus
Kangu	Bahunia acvminata	Farsia	Grewia	Banritha	Trichila
Kachnar	Zizyphus	Bakain	Melia	Banyan	Ficus

			azadirac		
Kathber	Acen aeuminatum	Bakarchha	Gypsophila	Baheda	Terminalia
Kanjira	Holoptelea	Bakli	Bellisica	Kilmora	Besberis
Kanju	Myrica esculenta	Boj	Quercus	Kuri	Holasshena
Koffal	Marusserrata	Buraush	Rhododendr on	Harsinga	Nyctanthes
Kimu	Acen oblsngum	Bair	Zizyphus	Kunja	Rosa srnonii
Kirmoula	Euonymus	Vail	Aegel masmelos	Ghigharu	Pysacantha crenulata
Kum-Kum	Schleichera	Bhimal	Grewia asiatica	Dhatura	Datura
Kusum	Pinus wallichiana	Bhotia Badam	Cqrylus	Van Baman	Viscum album
Kail	Heteropogon confrotus	Gauj	Milletia extensa	Taroor	Dioscorea deltiodea
Kumriya	Pnoenix	Maida Lakadi	Litsea	Khudera	Digera muricata
Date palm	Cetis austarpifolia	Dudhi	Euphorbia chamaesyee	Gilori	tirospora siuensis
Khadik	Quescus semecospifolia	Khagsi	Swida macropluylla	Dudhivel	Trachelosperm um axillare
Kharsu	Acacia catechu	Reetha	Sapindns	Malu	Bauhinia vahlii
Khair	Acer	Rohini	Mallotus	Regal	Sinarundinaria
Gad, Papdi	Slaix	Lasoda	Cordia dichotoma	Boss	Dendrocalamus
GadBheas	Rumex nepalensis	Loud	Symplocos	Kantha Bamboo	Barleria cristata
Pahari Spinach	Swertia	Mulberry	morus alba	Teak	Tectona grandis
Chirayta	Elaeagnus	Sheesham	Dalbergia	Sandan	Ougeinia
Giwai	Ficus racemose	Siras	Albizia	Chair	Lindera
Gular	Shorea robusta	Forest lemon	Clausens	Jai	Lindera
Sal	Prunus armenica	Podina	Mentha	Chirchita	Achyranthes aspera
Apricot	Saurauia	Bajradanti	Potentilla	Timur	Zanthoxylum
Gozina	Carpimus	Forest celery	Micromeria	Suini	Schefflera
Chamakhd ik	Gentiana	Forest Kapasi	Thespesia	Titpati	Corchorus
Chirauti	Pinus	Basic	Adhatuda	Akashvel	Cuscula

Chir	Wendlandia hyni	Bichhu	Martynia	Banda	Korthalsella
Cheela	Aesandra	Bhang	Cannabis sativa	Chulu Banda	Ficus auriculata
Chura	Prunus cornuta	Ramboss	Gavae	Thakal	Phoenix
Jamnoi	Syzygium	Zhigan	Lannea	Gaderi, Tobacco	Verbascum
Jamun	Ficus auriculata	Piriya	Saulsurea	Kush	Saccharum spontaneum
Timla	Wendlandia	Doob	Cyanodon	Sirig Kala	Albizia chinensis
Tiruchunia	Quercus floribuns	Thuner	Taxus baccata	Surai	Cupressns
Tilouj	Toorhexandra	Semal	Bombax ceiba	Pomegranate	Punica Granatum
Tun	Cinnmomum	Harad	Terminalia chebnla	Jhagora	Echinochloa
Cinnamon	Ficus nerifolia	Haldu	Haldinia	Van Mandwa	Heteropogon lontortus
Dudhla	Syzygium venesum	Achhoe	Rubus biflorus	Dumsal	Miliusa

Source: Terai Eastern Forest Impact Office Nainital 2018

**Uttarakhand State Forest** - The state's vegetation distribution has been classified in Table No. 4.2 and Figure No. 4.1, 4.2, 4.3 and 4.4 according to the region based on different altitudes, vertical distribution of temperature and rainfall.

**Table Number 4.2: Uttarakhand State Natural Forest Distribution**

S.No	Forest type	Height in metres
1	Tropical moist deciduous forest	500-750
2	Subtropical pine forest	750-1200
3	Tropical dry deciduous forest	1200-1800
4	Moist temperate forest	1800-2500

Source: S.C. Joshi Kumaun Himalaya: a geographical perspective of resource development.

**1- Tropical moist deciduous forest.** This forest species is found in the lower altitude and southern parts of the Shivalik region between 500 and 750 meters altitude. It mainly includes major tree species and shrubs like Sal, Saj, Jamun, Kusum Toon, Tejpat, Mango, Walnut, Litchi, Teak, Amaltas, Amla, Lemon, Bamboo and Kuri, Black Grass etc.

**Figure No. 4.1 Tropical Moist Deciduous Forest**



Source: Mohan Singh Sammal Unpublished Research Thesis 2020 Kumaon University, Nainital

**2-Subtropical Pine Forest-** Pine forest is mainly found in areas with an altitude of 750-1200 meters, while the maximum development of pine forest is seen in areas with an altitude of 1000-1500 meters of the state.

**Figure No. 4.2 Subtropical Pine Forest**



Source: Mohan Singh Sammal Unpublished Research Thesis 2020 Kumaon University, Nainital

**3-Tropical dry deciduous forest.** Tropical dry deciduous forest is found in areas above 1200-1800 meters of altitude in the state, in which semal, pine, saaj, tun, surai, boss, regal, mulberry, palash, anjan, scorpion grass and other types of vegetation are found.



**Figure No. 4.3 Tropical dry deciduous forest**

Source: Mohan Singh Sammal Unpublished Research Thesis 2020 Kumaon University, Nainital

**4-Moist Temperate Forest-** The moist temperate forest area is spread from an altitude of 1800 to 2500 meters. Where pine, banyan, burash, anyar, deodar, birch, ghigharu, kilmora, kafal, uttis, hisalu, mehal, are the main vegetation found.

**Fig. No. 4.4 Moist Temperate Forest**

Source: Mohan Singh Sammal Unpublished Research Dissertation 2020 Kumaon University, Nainital

**4- Sub-alpine and alpine forests-** These forest species and forest areas mainly include areas with an altitude of more than 2700 meters, in which mainly silver fir, blue pine, spruce, deodar, birch etc. oil-rich forests are found.

**5- Alpine shrubs and grasslands-** These forest species are found at an altitude of 3000-3600 meters, which are found in scattered form apart from shrubs, which include juniper, willow, and ribs forest grass species, the biggest feature of which is that these alpine species are found above the tree line, in which grasslands are also located which are called Bugyal, Payar, Meadow or Alpine Pasture. Where swamps are also seen in some places due to the melting of snow during summer. The second speciality of these forests is that many types of

flowers like Atis, Vatsnam, Shalamjanja, Som, Nirvishi, Rudravanti, Vishkandar, Fenkamal, Kastura Kamal, Panja and herbs like Guggal, Bill, Jatmasi, Kut, Mamiri, Ratanjyoti and Pribhulas are found here. Velvet grass grows here during the period from June to September, providing a migration site for migratory cattle herders and fodder for animals (sheep and goats).

**6. Tundra-like vegetation** - This type of forest cover is seen in areas with an altitude of 3600 to 4800 meters, in which mainly grass, moss and lichen grow, while snow remains frozen in most of the area. Apart from this, administrative division of forests has also been done which includes 70.46% of forests under the forest department which are completely under the control of the government, 13.76% forests of the total area of the state under the revenue department which provide some exemption for grazing animals and cutting wood, 15.32% forest area under forest panchayat which is under local forest panchayats and 0.46% is under private and other institutions. At present, forests and biodiversity of the state are being affected on a large scale due to human settlements, agricultural activities, urbanization, forest fire and climate change, for the protection of which many people's movements have been born in the state, the most important of which are Rawai movement Tehri 1930, Chipko movement 1972, forest movement of Chamoli 1977, Drugi Pantoli movement (Chamoli), Raksha Sutra movement 1994 (Tehri), Jhapto. Chhino Andolan 1998 (Chamoli), Maiti Andolan 1996 (Chamoli) and the Mixed Forest Model (Rudraprayag) have been the main ones.

**Wetlands of Uttarakhand-** The concept of wetlands was first accepted at the global level in 1971 by the conference held in the city of Ramsar, Iran, which is also known as the Treaty on Wetlands. The objective of wetland conservation is to provide climate balance, water conservation and protection of biodiversity. The wetland area in the state is spread in different parts at an altitude of 300 meters to 5000 meters. As a result of the preliminary survey and assessment, their number has been recorded as about 116.

**1. Asan Wetland Conservation Area-** The first wetland protected area of the state is the Asan Conservation Reserve, which was recognized for the first time by Ramsar and got the first Ramsar site. It is located on the banks of the Yamuna River in Dehradun district. It is the first wetland site of international importance spread over 444 hectares of land. Based on the ZSI 2003 Hussain and De Roy classification, it is included in the Indo-Ganga Monsoon Forest Wetland category. Its wetlands support rare species and threatened ecological

communities, biodiversity, support critical life cycle stages or adverse conditions, abundance of water birds, fisheries which depend on the freshwater system created by the Asan reservoir which serves as a perennial fauna habitat, fed by the Asan and Yamuna river channels. The Asan wetland area also serves as a migratory corridor between national parks, wildlife sanctuaries and reserved and protected forests. Asan has been notified as a conservation reserve under Section 36A of the Wildlife Protection Act 1972 by the Uttarakhand government.

The construction of a dam in the Asan River leads to the deposition of silt on the wall, creating an optimum habitat for bird species. At present, 330 species of birds are found here. Apart from this, red-headed vultures and white-tailed vultures, which are endangered species, Ruddy Shelduck, Indian Spot-billed Duck, Painted Stork Bar-headed Goose, etc. This wetland is especially home to water birds, which is also called the paradise of birds living in winter.

**2. Asmoda Wetland-** This wetland is located under Rajaji National Park. Many types of aquatic birds and other forms of aquatic life are found here. This site is an important place for bird lovers.

**3. Dharchula Wetland-** This protected area is located in the Pithoragarh district in which many species of biodiversity are found. Rare and endangered flora and fauna live here.

**4. Lakes of Nainital-** Wetland sites are found in most of the lakes of the Nainital district. Many water birds and weeds are found along with wetlands in Bhimtal, Naukuchhiyatal, Sattal, Khurpatal Sadiyatal etc. This wetland area also plays an important role in balancing the local climate.

Conservation of wetlands of Uttarakhand plays a special role in environmental balance, flood control, resource conservation and providing livelihood to the local community, but at present it is facing many challenges due to climate change and human intervention. Therefore, there is a dire need to work at the national level for the conservation of wetlands. Because being a mountainous region, there is a decrease in the sites of wetlands, these areas are found only in some limited areas.

## Uttarakhand Wildlife and Protected Areas (National Parks and Wildlife Sanctuaries)

All the policies made at the national level for biodiversity conservation have been adopted in Uttarakhand, in which mainly national parks, wildlife sanctuaries and biosphere reserves have been implemented to protect and safeguard dimensions like biodiversity. Biodiversity is a natural gift which is difficult to compensate for once it is damaged, that is, it becomes extinct forever. Other conservation efforts of wild biodiversity wealth include Asan Wetland Reserve, Jheelmill Lake, Pawalgarh Conservation, Nanda Devi Himalayan Bird Conservation Reserve, a high level zoological park, bio-safe area and Nanda Devi and Valley of Flowers National Park have been protected for biosecurity as world heritage. Apart from this, community-based programs like Snow Leopard, Tiger, Kachula Khark and GFMM have been run for eco-friendly tourism development and conservation of biodiversity. The details of wildlife protected areas, national parks and sanctuaries adopted for biodiversity conservation in Uttarakhand are as follows.

### 1. Wildlife National Park.

**1. Corbett National Park** - The credit of being the first park in India as well as in Asia for wildlife conservation goes to Corbett Park which was established in 1936 as Hailey National Park named after the then Governor Sir Hailey after independence came to be known as Ramganga National Park. But in 1957 it was renamed Corbett National Park in memory of the great nature lover. Corbett National Park is spread over an area of 520.82 sq km in the Shivalik and Bhabar regions of Nainital and Pauri districts of which 312.76 sq km is located in Pauri and 208.8 sq km in the Nainital district. The entrance of the park is at Dhikala situated in Ramnagar town of the district. This park is known mainly for the conservation of birds. A plain area named Patli Doon is also found in this park. In the year 1973, this park was declared as the first bird conservation area of India.

Since then, the number of birds is increasing continuously. A maximum number of tourists of the state come here every year for wildlife tourism. In the central area of this park, a silence zone of around 500 meters has been declared. There are around 570 bird species, 25 reptiles and 75 mammals in Corbett National Park and mainly crocodile, chital, sambhar, barking deer, tiger, elephant, leopard, python, deer, monkey, langur, bear and many other types of birds are found here. The trees of mixed type of protected forest species like



sal, sheesham, teak, bamboo and shrubs have been preserved here as heritage and provide an excellent habitat to the wild animals. In terms of forest cover, dense forest cover is present in the plains and foothills while sparse vegetation cover is present in the mountainous region. Due to the flow of Ramganga and its tributaries Ghura, Banaili, Kotarau, Fika, Swalده etc. in the park, most of the area is always green. The main valley of the state Patali Doon is also situated in this region.

**2. Govind National Park-** Govind National Park was established in Uttarkashi district in 1980 by demarcating an area of 472 sq km. This national park is named after former Prime Minister of India Govind Ballabh Pant. In terms of biodiversity, this is a rich area in which many species of plants and a wide range of wildlife are found, in which snow leopard, Himalayan black bear, musk deer, Siro, Bharal, Himalayan Thar, Koklas partridge, Monal partridge and many species of birds, butterflies and insects are protected. The park has rugged topography, glaciers, natural parks, glaciers and ancient alpine grasslands. For tanking and adventure tourism, picturesque views of the peaks of the Himalayas are visible.

The world famous holy river Ganga also originates from here. In Govind National Park, the endangered snow leopard from the Himalayan region is best adapted to high altitudes. Apart from this, the Himalayan black bear is the second most populated animal. The state animal of the state is the musk deer, and the Siro, which is found only in rocky and dense forests, is found in this park. For human activities, it is especially famous for trekking (Har ki Dun, Kedarkantha) which provides excellent conditions to understand the reality of nature and to see flora and fauna. Apart from this, Bhojpatra, Deodar and Oak plants are found in abundance here.

**3. Nanda Devi National Park-** Nanda Devi National Park is spread over an area of 624 km in Chamoli district of the state, which was established in 1982. This park is spread up to the highest place in the world (7817 meters). The average height of the park is from 3,500 meters to 11,500 meters, in which about 70 high mountain peaks are present. Dhauri Ganga, a tributary of Rishi Ganga, flows in the park. In 1988, UNESCO included it in the World Heritage and in the year 2005, its name was changed to Nanda Devi and Valley of Flowers National Park. The headquarters of Nanda Devi Park is Joshimath. The major forest species include deodar, blue pine, fir, spruce, banj, pine, kharsu, birch, jennifer and soft alpine grasses below the snow line enhance its beauty. Wild animals like black bear, snow leopard, brown bear, vulture and colourful birds make it look very charming.

**4. Valley of Flowers National Park-** This is a unique valley of the world in which more than 2000 species of plants of the most colourful flowers of the world can be seen. It is also known as Valley of Flowers. In 1988, it has been included in the World Heritage as a natural site by the United Nations organization UNESCO. Valley of Flowers was discovered by Edmund Frank Smith who has described it in his book "The Valley of Flowers". Geographically, this area is situated in the form of a bowl in the Western Himalayas. This park is also known as Pushpavati Valley, which is named after many species of fruits and on the other hand, it has been given this name due to the river Pushpavati flowing in this valley. The total area of this park is 87.5 sq km. Many types of flowers like Pushpa-padam, Pushkar, Pushpa Primula, Blue Poppy, Vish Kandar, Bahma Kamal, Vatsanam, Shalam Panja, Fenkamal, Himkamal, Rudradanti, Shivdhatura, Kut, Som, Ratanjot, Mammiri, Nivirvashi and Jatamasi are prominent here. It is the only place in the world where many types of flowers are found. The description of this valley is also found in ancient books and religious text Skanda Purana, where a large area of many types of medicinal plants is found. According to mythological stories, during the time of Ramayana, when Lakshman fainted, Sanjeevani herb was searched from this mountain. Whereas this valley was presented to the modern world by Edmund Smith. In the year 2000, the area of Nanda Devi Biosphere Reserve has been made 586,069 sq km in which Valley of Flowers has been declared as the reserve zone of Biosphere. This park is situated at an altitude of 5431 meters in which deciduous trees, conifers and alpine grasses are found. Among the tree species, pine, deodar, bamboo, Burross oak, juniper trees are mainly found.

**5. Rajaji National Park-** Rajaji National Park is spread over an area of 820.42 sq kms in Haridwar, Dehradun and Pauri districts. This park was established in 1983 by merging Cheela and Matichur animal sanctuaries and was named after freedom fighter and first Governor General of India C. Rajagopalachari. This park is spread over the Shivalik range, Doon valley and Bhabar geographical units in which the rivers have formed wide and narrow valleys. The major rivers are Suswa, Saug, Motichoor, Mundhal, Gaj, Mohand Dholkhand, Sukhrao, and Sherpurrao. Small rivers of Yamuna flow irrigate it. In the year 2015, it has been given the status of the second tiger reserve of the state. 23 types of mammals like lion, elephant, chital, tiger and nilgai and 313 types of birds are found in the park. Among the natural vegetation, sal, khair, sheesham, bakali, sain, siras and rohani are the major tropical and subtropical forests. This is the first park of the state to be connected with the most transport routes.

**6. Gangotri National Park** - This Park was established in 1989 in an area of 2390 sq kms in Uttarkashi district. This is the area spread around Gangotri glacier whose average height is 1,800 meters to 7,083 meters. Deep valleys, high mountains and snow-clad mountains are found in this area. The main river flowing here is Bhagirathi. Various types of vegetation, rhododendron, deodar and birch and alpine vegetation are mainly found in the park. Apart from this, leopard, musk deer, snow leopard, black bear and rare wild animals are found among the animals. This park has been very popular for tourism and trekking in which Gomukh, Tapovan are the major treks. Thousands of devotees come here every year. The park is currently doing the work of conservation of Himalayan ecosystem and wildlife on a large scale because Gangotri National Park is one of the unique national parks of the world. Apart from natural qualities, it is also a center of spiritual peace.

## **2. Wildlife Sanctuary**

**1. Govind Wildlife Sanctuary-** This wildlife sanctuary is located in Uttarkashi district which was established in 1955 in an area of 485.89 sq kms. It is the first wildlife sanctuary of the state which is situated in the catchment area of Rupin and Supin rivers. The wildlife mainly includes snow leopard, musk deer, Bharal, Himalayan Thar, leopard, forest cat, black and brown bear, Kakar Sambhar, Sehi. The birds mainly include Monal, Pheasant, Koklas, Kalij, Chakor, Golden Eagle and the flora mainly includes Burans, Deodar and Bhojapatra, Fir, Spruce, Moru, Blue Pine, Cyprus and Alpine grasses.

**2. Kedarnath Wildlife Sanctuary-** This wildlife sanctuary was established in 1972 in the Kedarkhand area of Chamoli and Rudraprayag in an area of 957.20 sq kms. Snow-clad high peaks, glaciers, ice valleys, gorges and small plains formed by rivers are seen at some places in this animal sanctuary. Among the wildlife species, snow leopard, leopard, Himalayan black and brown bear, musk deer, Thar, ghoral, sambhar, serow, kakar, wild boar and jackal, among birds, monal pheasant, koklas pheasant, kalij, chakor and among flora, bos, burros, fir, pine spruce, thuner, moru, kharsu and pangar, oak, hemlock and soft grasslands are mainly found.

**3. Askot Wildlife Sanctuary-** Askot Wildlife Sanctuary was established in Pithoragarh district in the year 1986 in 599.93 sq. km. In which mainly Musk deer, Snow Leopard, Bear, Bharal, Thar birds include Koklas, Pheasant, Monal, Hill Partridge, Himalayan Snowcock, Tegopan and plants include Bhojapatra, Deodar and Oak Kafal, Ayar, Bushes and Bugyal.

**4. Sonanadi Wildlife Sanctuary-** Sonanadi Sanctuary was established in 1987 in an area of 301.18 sq. kms. in Pauri Garhwal district. In this park elephant, lion, leopard, chital, sambhar, kakar, jackal, wild boar, crocodile, gharial, python, monitor lizard, birds include Great Pied, Hornbill, Pallas, Fishing Eagle, Kalij, Himalayan Pied King, Fisher and plants include Sheesham, Khair, Asna, Jamun, Boss apart from many other species are found here.

**5. Binsar Wildlife Sanctuary-** Binsar Wildlife Sanctuary is located in Almora district which was established in 1988 in an area of 47.07 sq. kms. Mainly leopard, black bear, ghoral, kakar wild cat and wild boar are found among the wild animals, Monal, Himalayan snowcock, golden eagle among the birds and Bonj, Burross, Surai, Pine Ayar and other shrubs are found among the flora.

**6. Mussoorie Wildlife Sanctuary-** Mussoorie Wildlife Sanctuary was established in the year 1993 in Dehradun district, whose area is 10.82 sq kms. It is the smallest wildlife sanctuary of the state. Mainly the wildlife found here are Ghoral, Kakar, Langur, Monkey, Sehi, Pig, Bear, Leopard, and birds like Partridge, Quail, Chakor, Wild Cock and flora like Sal, Kachnar, Kusum, Amaltas and other shrubs.

**7. Nandhaur Wildlife Sanctuary-** This wildlife sanctuary was established in the year 2012 in Nainital district in an area of 296.95 sq kms. This sanctuary is named Nandhaur because it is spread around the Nandhaur River. This sanctuary is situated in the Shivalik and Bhabar region, where the major animals found are elephant, chital, kakand, ghurda, nilgai, pig, bear, thar, deer, sehi, monkey, langur, tiger, and many types of birds and among the plants, sal, kusum, haldu, saaj, saanan, sheesham, teak, kanju and other small bushes and grasses are mainly found. This is the newest wildlife sanctuary among the protected areas of the state.

### **Biodiversity crisis in Uttarakhand-**

The basis of loss of biodiversity in Uttarakhand is also similar to the loss occurring in other parts of the country. But mainly it has been seen in two factors.

- 1) Natural loss of biodiversity
- 2) Human-induced loss of biodiversity

**1-Natural loss of biodiversity-** Natural loss of biodiversity due to landslides, earthquakes, forest fires, soil erosion, snow cover, avalanches, cloud bursts, floods, droughts, excessive rainfall and climate change effects are affecting biodiversity and land imbalance.

Biodiversity loss is causing harm to the biodiversity and fauna of a wide area. 16.17 June 2013 Kedarnath landslide, 2002 Tehri, Kedar 1998, Pithoragarh Malwa 1998, Rudraprayag Unkhi Math 1992, Chamoli Pindar Valley 1980, Gyansu Uttarkashi landslide and 1803, Badrinath and 1809 Garhwal earthquakes of 9 point and 8.50 Richter scale respectively and cloudburst incidents since the past decade respectively 2 May 2018 Chamoli, 1 June 2018 Tehri, Pauri, Uttarkashi, Nainital and Pithoragarh 11 July 2018, Dehradun 2021 Major incidents of Nainital district are suddenly causing harm to natural vegetation and animals and the bio-wealth spread over hundreds of kilometers of land is getting damaged.

**2- Human-induced loss of biodiversity** - The Mountain structure of Uttarakhand covers **86%** of the state's land area. Due to its physical unevenness, it is constantly being affected by human intervention. Humans have caused loss of biodiversity due to the damage caused by activities done for their own development such as urbanization, construction of roads, railways, tunnels, hydroelectricity and other developmental projects, due to which the habitat of animals, ecosystem and vegetation cover are constantly being damaged. Apart from this, human fires in forests for agricultural productivity and animal fodder are burning thousands of hectares of forest land every year, due to which the habitat of animals and many plants are being destroyed forever, which is a very sensitive sign for the destruction of rich biodiversity. Apart from this, human intervention in the natural habitats of organisms, unplanned cutting of forests, development projects, fragmentation of natural adjustments and excessive use of biological resources show red signals for both natural and man-made biodiversity, resources and ecosystems, thus ignorance of the importance of biodiversity is helping in the destruction of biodiversity in Uttarakhand.

### **Forest Degradation-**

Among the environmental threats, the most impact is being caused by forest destruction because the basis of life on the earth's surface is the forests on the earth's surface. Urbanization, industrialization, expansion of agricultural land to nourish the rapid population have become factors of forest destruction, due to which many types of problems (irregularity in the amount of rain, increase in insolation i.e. heat, landslides, increase in the number of dried up hot and cold streams) are increasing quantitatively due to forest destruction, where forests are cut from about **2.6** crore hectares of area every year. According to the **15th Forest Report 2018**, **45.43%** of the total forest area in Uttarakhand

state is fully forested. But the forests have been exploited in different forms from the British period till the present time. Where forests were away from human reach, the annual forest fires are destroying forests on a large scale. On the other hand, forests have been developed rapidly in plain areas through farming activities, residential areas and animal grazing.

The reality can be easily understood from the forest movement (Chipko, Pani Rakhon, Raksha Sutra, Dungi-Paintoli, Jhapto-Chhino, Maiti movement and mixed forest-farming model) carried out by the common people of Uttarakhand to stop the intensity of forest loss. From National Forest Policy **1952** to Forest Act. **2006**, many efforts were made to stop the deforestation but even today, not much success has been achieved in the protection of forests. Every year, due to human activities and natural disasters, an average of **4.056** hectares of forest is affected by forest fire, road and agricultural work every day in the state. Encroachment of forest land is causing damage to the forest area especially in the plains. At the same time, due to the increasing temperature due to climate change, forests are drying up and falling prey to fire. In the middle and high Himalayan regions of Uttarakhand, where forest revival is possible only through nature, the destruction of forests is providing an environment conducive to natural disasters. Uttarakhand state, along with being rich in forest wealth, is currently being most affected by forest fire. About **45** percent of the state is covered with forest and **64** percent of the state is covered with forest cover, but every year due to natural and man-made fires in the forests, lakhs of hectares of forests are burnt to ashes.

The forest fires are affecting the forest ecology and the entire living ecology and all types of biotic-inbiotic assets are being destroyed by fire. Along with destroying the natural beauty of the state, it is also giving rise to disasters like fire and landslides. The fires in Uttarakhand are caused by natural and man-made factors. Among the natural factors, friction of stones and lightning during the dry period in the mountainous regions are the major causes of fire, while on the other hand, among the man-made factors, the forest fires set for agricultural work and animal fodder, deliberately throwing bidi cigarettes, fireworks and short circuits in the electric high tension lines are the major ones. But the fires in the state of Uttarakhand have been a historical man-made event. Forest fires used to occur for a long time in the traditional methods of agriculture and animal husbandry here, but at present it has become a disaster.

Due to the increasing global temperature caused by man-made climate change, most of the state is becoming dry, which is increasing the amount of heat, making the conditions of fire easier, due to which the area of forests is decreasing, even though this area is showing an increase in the government figures, the results of research done in the past years and local experts show that due to the incidents of fire in the forests of the state, due to melting of snow in the high Himalayan snow-covered areas, these areas have come under the purview of fire. According to the Down to Earth Report **2021**, till November **2021**, about **1.76** billion tonnes of carbon dioxide was emitted due to forest fires, which made the air poisonous. Thus, forest fire has put the entire state into worry and the help of Indian Army ships is being taken for controlling forest fire for the last **3-4** years.

In Uttarakhand, the period of forest fire has been fixed from March to June, but now incidents of forest fire and forest burning have started occurring from January-February itself. In the year 2016, 4538 hectares of forest were burnt to ashes due to forest fire, due to which seven people died. On 13 June, 2024, 4 people died while extinguishing forest fire in Vinsar of Almora district and 10 people died in the entire state (Amar Ujala). Especially the decrease in the amount of rainfall and abundance of pine forests are increasing dryness in the environment, as a result of which forest fire is spreading rapidly. According to the Forest Research Institute, Dehradun, the state generally suffers an average loss of Rs 1 lakh due to fire in 100 hectares of forest area, whereas the loss is considered to be Rs 498 per hectare in Sal forest and Rs 252 per hectare in mixed forest. Thus, every day 4.056 hectares of forest in Uttarakhand burns due to forest fires. According to the report of Down to Earth dated 3 May 2022, 138 incidents of forest fires occurred in the state from 15 February to 31 March, due to which 182.52 hectares of forest area was burnt, which is no less than a disaster. Forest fires cause huge damage to the innumerable medicinal herbs, insects, vegetation and human assets found in the state.

**Loss of wildlife habitat-** Loss of wildlife habitat in Uttarakhand has become a serious problem at present, which is affecting both the biodiversity and environment of the state. Human activities such as forest destruction, development of transport facilities, and expansion of agricultural land, animal grazing and forest fires are mainly responsible for causing damage to wildlife habitat. Due to human interference, the habitat of wild animals is shrinking day by day, due to which wild animals are leaving their original habitats and moving towards human settlements or are getting extinct of their own species. Humans are



clearing forests for infrastructure development to expand roads, railways, hydroelectric projects, tunnels and air services, due to which wild animals are not safe even in their habitats due to the horns and noise of vehicles passing through here and many times wild animals are dying due to collision with the means of transport. In the forest areas, especially the forest khattas and the settlements of Gujjars have closed many wildlife corridors in the Bhabar and Terai region of the state, due to which the movement of wild animals has been blocked.

According to the Himalayan Study Mission Project Research Report, the lack of mixed forests in the Terai forest area and human intervention has affected the habitat of tigers. Factors such as lack of fruit trees, grass and food in the forests and density of trees are also playing an important role in affecting the habitats of wildlife. In the research started in the year 2019 under the National Himalayan Mission, it has been found that due to change in the land use of the Terai forest, the habitats of the forest and wildlife are in crisis. The study of 48 thousand hectares in Ramnagar, 40 thousand hectares in Terai Central, 62 thousand hectares in Terai Eastern and 59 thousand hectares in Haldwani and Champawat and other districts has revealed that wildlife habitats and bio-ecology are being affected by human-induced pressures on wildlife.

This problem of wildlife habitats is being seen in the entire state, especially in the plains, the habitats of wildlife have been affected the most. Because in the plains, the activities of agricultural land expansion, urbanization, industrialization have adopted the process of cutting forests for timber and replanting trees, since then the dense cover of forests is becoming treeless and the wild animals are facing many problems in moving around. The factors that mainly affect the habitats of wild animals in the state of Uttarakhand can be adopted as follows.

**1. Developmental projects** - After the separation of Uttarakhand state from Uttar Pradesh, forests have been destroyed on a large scale for the development of many types of infrastructural structures such as roads, housing, hydroelectric projects, tourist places, railways and underground tunnels and for the establishment of human settlements and administrative units. In which most of the wildlife habitats have been affected by hydroelectric projects. Because hydroelectric projects affect the forest area and the habitats and routes of wild animals by new construction and water logging on a large scale, whereas in many areas of the state, new tourist places are being developed in the name of tourism



facilities and the number of tourists, railways, underground routes, all of these are affecting the habitats of wild animals in some way or the other.

**2. Expansion of human settlements-** The rapid urbanization in the state and the spread of buses, villages and cities around the forests due to tourist places are rapidly shrinking the forests. Apart from this, due to the movement of large number of tourists, even the quiet areas have become noisy, due to which the habitats of wild animals are getting affected, apart from this, due to the increased human activities in the forest by rural cattle keepers and shepherds for grazing their domestic animals, the habitats of wild animals are being encroached and they are getting affected.

**3. Forest fire-** Thousands of square kilometers of forest area is being burnt to ashes due to forest fires every year from March to June in the state. The incidents of forest fire are increasing year after year due to which lakhs of animals are getting burnt in the fire and are becoming homeless. Forest fires are burning not only trees and plants but also animals. Excessive drought and lack of rain in the state have increased the incidents of forest fires, due to which the life of wild animals is very dangerous in summers. According to Hindustan Daily News, in the year 2022, there were 2,171 incidents and 3416.2 hectares of forest land, in the year 2023, there were 718 forest fire incidents and 862.41 hectares of forest area, in the year 2024, there were 650 fire incidents and 800 hectares of forest were destroyed by burning due to which wildlife habitats were damaged on a large scale and damage will continue to happen in the future as well.

**4. Changes in environmental elements-** Due to the effect of climate change at the global level, changes have come in the weather elements in the state of Uttarakhand as well, due to which untimely weather events are increasing. Due to the increase in temperature, the water level and natural water sources are drying up, while there is a shortage of drinking water for the wild animals, due to which they are being forced to leave their original habitat and migrate to other places. Due to the increase in the amount of drought, there has been a sharp increase in the incidents of forest fires, which is unbearable for the wild animals. Due to the same extreme weather events, due to increase in the number of floods, landslides, avalanches, fires and other disasters, not only the habitat of wild animals is getting affected, but in some places they are getting destroyed forever, in which landslides have been the most effective because it affects the forest cover on a large scale such as Nainital landslide 1880, Uttarkashi earthquake 1991, Malpa landslide 1998, Chamoli earthquake 1999 and

Kedarnath disaster 2013 which were the biggest natural tragedies in the history of the state due to which forests, wild animals and human habitats were affected and there was loss of life and property. In this way, the habitat of wild animals is getting damaged due to natural incidents occurring due to the effect of climate change.

**5. Tourism-** Tourism is the backbone of the economy of the state of Uttarakhand, especially natural tourism is being promoted on a large scale in the state, according to 28 tourist data collection centers of the Tourism Department, in the year 2022, 5 crore tourists and in the year 2023, 7 lakh tourists came here for religious and natural tourism, which shows that the number of tourists in the state is continuously increasing. The habitat and living conditions of wild animals are being affected by such a large number of people coming for tourism every year, especially in the peaceful areas with abundant forests, along with this, the forest ecology is also being harmed by throwing food items and packaging waste in forest areas, which will gradually take the form of a crisis for the forest animals in the present and a disaster in the future.

### **Human-wildlife conflict-**

The highest number of incidents of human-wildlife conflict due to human interference in wild habitats has been occurring in the state for the last 15-20 years. Forest research has made it clear that wild animals have been affected by the pressure of human activities in forest areas, due to which they are migrating from their original habitats to other areas or are moving towards human settlements in search of food and drinking water, due to which many times human casualties are also occurring due to mutual conflicts. A comparative study of research conducted on six corridors under the National Himalayan Study Mission has revealed that the habitat of wild animals is being completely affected due to change in land use in the Terai region. Due to human activities, the reduction of water bodies in forest areas, reduction in forest cover, expansion of human settlements, climate change, and increase in the number of wild animals and human interference in wild areas are increasing the conflicts between humans and wild animals. According to the research report, more than 90 cases of human-wildlife conflict have been registered in the Kosi corridor alone since 2017.

According to human-wildlife conflict records, 50 people were killed by tigers in 2019, 46 in 2020 and 31 in 2021, while 585 people were killed by elephants in 2019-20 and 461 in 2020-21. According to the report of Down to Earth, Uttarakhand is likely to be

registered as one of the most sensitive areas in terms of human-wildlife conflict. In the three years from 2021 to 2024, 1,222 people were injured in human-wildlife conflict and on an average 407 people were attacked by wildlife. According to the report of the Indian Forest Survey 2021, due to the number of wild animals in Uttarakhand being more than the capacity and the reduction in the carrying capacity of forests, human-wildlife conflict is increasing. The major wild animals attacking humans have been elephants, tigers, bears and snakes etc.

At present, such a situation has arisen between humans and wildlife that the terror of tigers has spread in many places of the state (Rikhnikhil, Dhumakot, Kotdwar, Ramnagar, Bhimtal, Lansdowne, Rudraprayag, Munsiyari, Berinag, Dharchula, Bageshwar, Bhilangana, Ghanshali, Chamoli and Uttarkashi, almost the entire Uttarakhand) that daily work is being conducted under the supervision of the security personnel of the forest department in many schools and villages. Besides, apart from ferocious animals, monkeys, langurs and wild boars have left the forests and started living more in residential areas where they are harming both agricultural crops and humans. Even in many mountainous areas, 100% agricultural land has become barren due to wild animals. Even if efforts are made to drive away the wild animals, they cling to humans and many times they are even injuring the villagers. Wild animals have now abandoned their traditional food items and have become more dependent on agricultural crops because wild animals are getting food easily in the fields of farmers.

If they do not get food, they are attacking humans. To reduce the conflict between wild animals and humans, it is very important for humans to take effective steps like reducing human activities in wild habitats, controlling the number of wild animals, killing animals attacking humans, building boundary walls in residential areas and making wildlife corridors encroachment free in the interest of humans and wildlife.

---

#### **4.4 SUMMARY**

---

Ecology is a major link that determines the structure of the ecosystem. Through which the elements of different areas like forest, soil, sea, ocean, lake, grassland, desert and physical environment and their relations with organisms are studied through scientific techniques. In which ecology itself and community ecology have a special contribution in the demarcation of biodiversity. Ecology is also defined in the light of science as providing

balance with the environment because neglecting the ecological balance also causes natural and human disasters. In which various types of crises cause suffering for humans. For example, the ecosystem and biodiversity system of the entire world is being affected by the effect of climate change, its fearful results have been seen on the earth's surface, but environmental crises have become more intense in the last 3-4 decades.

Biodiversity is the variety or diversity found among organisms, which includes the diversity of ecosystems in species. It is essential to have species diversity to function among any particular community. Animal and human life is impossible due to the lack of biodiversity. All the needs of humans and ecosystems are fulfilled as a result of diversity, which are connected in a chain, just as the human body works by combining many tissues, in the same way the ecosystem operates biodiversity. In which all the organisms from harmful to beneficial to nature are included, for which Uttarakhand is a museum of all these. Due to special climatic conditions, all the flora and fauna produced here are used by the residents in some form or the other. No natural product is useless. For medicinal needs, it has been called a botanical forest in the Puranas. Biodiversity holds an important place in environmental pollution disposal, refinement, nutrition, soil formation, ecosystem stability etc.

The geographical conditions of Uttarakhand, the vast biodiversity here determines its place in the world heritage along with the entire country. The economy of the entire state is currently moving towards being operated by the bio wealth here. The resources here are dependent on the natural structure here. Environmental features and diversity have promoted eco-tourism and made it the pillar of livelihood. Forest cover and biodiversity are the identity of this Himalayan state. Its conservation is very important in itself and naturally because it is the basis of life on earth and helps in maintaining balance.

The state's forests, grassy meadows, wetland areas, protected parks, wildlife sanctuaries provide more vastness to the biodiversity and wealth here, as well as playing an important role in strengthening tourism and economy. Despite being a treasure trove of biodiversity, human activities have given rise to many types of environmental and wildlife crises by destroying forests and in the name of infrastructural development, due to which many people have also died. Human and wildlife conflicts are increasing day by day. Wildlife is increasingly moving towards human residential areas, which seems impossible to stop.

---

## 4.5 GLOSSARY

---

Ecology-	The science of the relationship of living things
Flora and fauna-	vocabulary related to plant animal life
Directory-	Group of different species
Correlation-	Relationship of one species with other species
Genetic diversity-	Variation derived from net characteristic
Wildlife sanctuary-	Protected area of wildlife
National park-	Government protected wildlife area
Ecological complexity-	Ecological complex area
Autology-	Study of single life is environment
Synecology–	Study of all the organism and community for in one place
Rich biodiversity-	A place within biodiversity
Migratory birds	Birds that change their habitat according to the season are called migratory birds.
Biological heritage	Wildlife, forests, bugyals, national parks, sanctuaries and biodiversity are the biological heritage of Uttarakhand state.
Natural tourism	All those natural scenes, biodiversity, forests, rivers, waterfalls and glaciers given by nature which attract tourists.
Alpine forests	Alpine forests are those forest species which grow in areas with an altitude of more than 2700 meters.
Asan reserve	Asan reserve is the first wetland protected area of the state which has been recognized by the Ramsar treaty for the first time.

---

## 4.6 ANSWER TO CHECK YOUR PROGRESS

---

- The natural beauty and environmental wealth of Uttarakhand state reveals the unique characteristics of ecological diversity.
- Urbanization, urbanization and climate change have given rise to many types of threats to the biodiversity of the state.
- Nanda Devi Biosphere has been protected by UNESCO World Heritage.
- Shivalik ranges are the most biodiversity dense area in the world in terms of biodiversity.
- According to the Forest Research Institute, 1943 plant species are found in Uttarakhand.
- Chipko movement was started in the year 1972 for the conservation of forests.
- Tropical moist deciduous forest species are found between the altitudes of 500 to 750 meters.
- Alpine shrubs are found at an altitude of 3000-3600 meters.
- For the first time in 1971, Ramsar convention was accepted globally for wetlands.
- Asan wetland is the first Ramsar site in the state.
- Asan has been declared as a conservation reserve by the Uttarakhand government under Section 36A of Wildlife Protection Act 1972.
- Jim Corbett Park was established in Nainital district in 1936.
- Govind National Park is named after former Prime Minister of India Govind Ballabh Pant.
- Valley of Flowers National Park is a unique valley in the world where more than 2000 unique species of most colourful flowers are found.
- Rajaji National Park is spread over an area of 820.42 sq km in Haridwar, Dehradun and Pauri districts.
- Nandhaur Wildlife Sanctuary was established in Nainital district in the year 2012.
- Every day 4.056 hectares of forest burn due to fire in Uttarakhand.

---

## **4.7 REFERENCES**

---

- Singh. S. 1974. Physicized Geography, Ecosystem and Ecology, Basundhara Publication Gorakhpur.
- OJha.S.K. 2018, Ecology & Environment. Badfiek Prakasini Prayagraj. UP.
- OJha. S.K. 2022. Uttarakhand. Baudhik Prakashan. Prayagraj.

- Maithani. D.D., Prasad Gaytri, Noutiyal Rajesh, 2015. Geography of Uttarakhand. Sharda Pustak Bhawan, University road Prayagraj. U.P.
- Sammal. M.S. 2020: Climate Change Impact on Agriculture, Food Security & Human Health in Balliya Catchment, Kumoun Himalaya; Unpublished Research Thesis, Kumoun University, Nainital.
- [Http/www. To install India water portal.](http://www.toinstallindia.com) August. Biodiversity.
- [Ktop/ www. To install Uttarakhand Tausiom.](http://www.ktop.com) How. In vegetation & animal.
- [Http/ www. Hindigyan Kash.Com.](http://www.hindigyan.com) Biodiversity.
- [https://upsctree.com/environment-asan-uttarakhands-first-ramsar- site](https://upsctree.com/environment-asan-uttarakhands-first-ramsar-site)
- <https://wegarhwali.com/govind-national-park>

---

## 4.8 TERMINAL QUESTIONS

---

### *(A) Long Answer Questions*

- Q-1.** What do you understand by biodiversity, describe the biodiversity of Uttarakhand in detail?
- Q-2.** Explain in detail the forests, grasslands and wetlands of Uttarakhand state in your own words?
- Q-3.** What do you mean by forest conservation, discuss the efforts made for the conservation of forests and wildlife in Uttarakhand state?
- Q-4.** What is the biodiversity crisis, what effects of deforestation have been observed on wildlife and humans, describe in detail?

### *(B) Short Answer Questions*

- Q-1.** Pine tree gyms, pine trees, pine trees, pine trees?
- Q-2.** Pine tree gyms, pine trees, pine trees?
- Q-3.** Pine tree gyms, pine trees, pine trees?
- Q-4.** Pine tree gyms, pine trees, pine trees, pine trees?
- Q-5.** Pine tree gyms, pine trees, pine trees, pine trees?
- Q-6.** Give a brief description of the forests of Uttarakhand?

**Q-7.** What do you understand by wetland, describe the wetlands of Uttarakhand?

**Q-8.** Briefly describe the national parks of Uttarakhand?

**Q-9.** Briefly describe the national parks of Uttarakhand?

**Q-10.** Write a short essay on forest loss and forest fire in Uttarakhand?

**Q-11.** Why is the biodiversity crisis looming in Uttarakhand, describe it?

**Q-12.** What are the main factors affecting the wildlife habitat, describe it?

**Q-13.** Discuss the human and wildlife conflicts in the state of Uttarakhand?

**(C) Multiple choice questions**

**Q-1.** In which region of Uttarakhand state is the maximum biodiversity found?

A) Great Himalayas

B) Lesser Himalayas

C) Shivalik Himalayas

D) Bhabar-Terai

**Answer C**

**Q-2.** According to the Uttarakhand State Forest Research, how many species of plants are found here?

A) 2000

B) 1943

C) 2122

D) 2325

**Answer B**

**Q-3.** Which land area is included under biodiversity poor areas?

A) Areas with altitude more than 2800 meters

B) Areas with altitude more than 3600 meters



- C) Areas with altitude more than 4600 meters
- D) Areas with altitude more than 2000 meters

**Answer C**

**Q-4.** Tropical moist deciduous forest this forest species is found in Himalayan regions?

- A) 500 to 750 meters
- B) 1200 to 1500 meters
- C) 1800 to 2800 meters
- D) Height more than 2800

**Answer A**

**Q-5.** What are the main species found in tropical dry deciduous forests?

- A) Semal, Pine
- B) Tun, Surai
- C) Bamboo, Regal
- D) All of the above

**Answer D**

**Q-6.** When was Corbett National Park established?

- A) 1935
- B) 1936
- C) 1937
- D) 1938

**Answer B**

**Q-7.** Who discovered the first park in the continent of Asia?

- A) Frank Smith
- B) Robert Pibury

D) Edmund Sen

**Answer B**

**Q-8.** When was Govind National Park established?

A) 1980

B) 1982

B) 1986

D) 1988

**Answer A**

**Q-9.** How many types of flower species are found in the world famous Valley of Flowers National Park?

A) 2100

B) 2800

B) 2900

D) 2000

**Answer D**

**Q-10.** Which was the first wildlife sanctuary of the state?

A) Govind Wildlife Sanctuary

B) Gangotri Wildlife Sanctuary

C) Kedarnath

D) None of the above

**Answer A**

**Q-11.** When did the Kedarnath landslide incident occur in the state?

A) 16. 17 June 2013

B) 13. 14 June 2013

C) 19. 20 June 2013

C) 11. 12 June 2013

**Answer A**

**Q-12.** Malpa incident of 1998 took place in which district?

A) Uttarkashi

B) Nainital

C) Pithoragarh

D) Haridwar

**Answer C**

**Q-13.** What are the main factors affecting the habitats of wildlife in Uttarakhand state?

A) Developmental projects

B) Expansion of human settlements

C) Forest fire

D) All of the above

**Answer A**

**Q-1.** What is the main reason for human and wildlife conflicts in Uttarakhand state?

A) Forest ecology Excessive human activities

B) Expansion of agricultural land

C) Excessive population of wild life species

D) All of the above

**Answer-D**

**BLOCK-2: UTTARAKHAND: AGRICULTURE, RURAL DEVELOPMENT  
AND SOCIO-CULTURAL DYNAMICS**

---

**UNIT- 5 AGRICULTURAL PRACTICES AND CROPPING PATTERNS,  
RURAL LIVELIHOODS AND SOCIO ECONOMIC CHALLENGES  
GOVERNMENT SCHEMS AND INITIATIVES FOR RURAL  
DEVELOPMENT**

---

***5.1 OBJECTIVES***

***5.2 INTRODUCTION***

***5.3 AGRICULTURAL OF UTTARAKHAND***

***5.4 SUMMARY***

***5.5 GLOSSARY***

***5.6 ANSWER TO CHECK YOUR PROGRESS***

***5.7 REFERENCES***

***5.8 TERMINAL QUESTIONS***

---

## 5.1 OBJECTIVES

---

After having the detailed study of this unit you will be able to:

- You will understand about the agricultural practices and crop rotation of Uttarakhand.
- Learn about rural livelihood and socio-economic challenges of Uttarakhand.
- Understand in detail about government schemes and initiatives for rural development of Uttarakhand.

---

## 5.2 INTRODUCTION

---

Uttarakhand, located in northern India, has a rich and distinct agricultural environment formed by its varied topography and climate. Here is an in-depth look at the state's agricultural methods and cropping trends.

The introduction of agriculture altered the direction of human development. Agriculture was invented in several regions and eventually spread around the world. Agriculture was practiced differently by ethnic groups in various places. They grew crops appropriate for their regions and established various agricultural strategies based on climate circumstances. The Himalayan region is rich in biodiversity, including both wild and terrestrial species. The people of the Uttarakhand Himalaya have created a unique agricultural method. Crops are grown in a two-year rotation. Wheat (*Triticum aestivum*), barley (*Hordeum vulgare*), and lentil (*Lens culinaris*) are planted for the first time during the Rabi season. In the Kharif season, rice (*Oryza sativa*) and barnyard millet (*Echinochloa frumentacea*) are grown as a mixed crop. In the next Kharif season, roughly 12 crops (including finger millet, amaranth, and legumes) are grown.

---

## 5.3 AGRICULTURE OF UTTARAKHAND

---

Uttarakhand is an agricultural state. Agriculture employs around 70% of the workforce. As a hill kingdom, 46,035 square kilometers of the overall area of 53,483 square kilometers are mountainous, with only 7,448 square kilometers being flat. Only 12.90 percent of this land is exploited for agriculture, totaling 6.90 lakh hectares. Uttar Pradesh and Haridwar districts contain the most of the state's agricultural land. The Government of India gave the state the Krishi Karma Consolation Award for food grain production. Hill agriculture accounts for 56 percent of the state's agricultural land, while plain agriculture accounts for 44 percent. Hill agriculture is just 11 percent irrigated, while plain farmland is 44 percent, although this is the primary agricultural production area. 94 percent of the area is irrigated. 69.77 percent of the population here lives in villages and works in the primary sector.

Agriculture and animal husbandry are the state's primary income sources. Agriculture accounts for 33.38 percent of the state's overall working population. Agriculture accounted for 10.81 percent of the state's GDP in 2018-19, according to the Economic Survey. Udham Singh

Nagar is Uttarakhand district with the greatest net planted land area. Champawat has the least net planted land area in Uttarakhand.

## Topography and Climate

**Topography:** Uttarakhand is known for its hilly and mountainous landscape, which includes the Shivalik range and parts of the Himalayas. This geography affects the crops that can be farmed.

**Climate:** The climate ranges from subtropical in the lowlands to temperate and alpine in the upper elevations. This variant supports a variety of agricultural operations.

## Major Crops

### Food Grains:

Terai and Bhabar areas are geographical zones in northern India and Nepal that have distinct features and biological systems. Here's the breakdown of each:

#### A. Terai Region

**Location:** The Terai region spans the southern Himalayas, including sections of northern India and southern Nepal. It is located directly south of the Siwalik Hills (the lowest range of the Himalayas) and reaches up to the Indo-Gangetic Plain.

Uttarakhand Terai area is located in the state's south, near to the Gangetic plains. This region runs along the Himalayan foothills, between the Bhabar region to the north and the Gangetic plain to the south.

Geographically, the Terai area of Uttarakhand comprises districts like Udham Singh Nagar and Haridwar. It is distinguished by its low-lying, marshy ground, which is rich in biodiversity and water supplies, making it good for agriculture and home to a variety of wildlife.

The Terai region is notable for its lush foliage, vast grasslands, and numerous rivers and streams that run through it. It is crucial to the state's natural balance and serves as a key zone for both conservation and agricultural activity.

The Terai region of Uttarakhand's climate is mainly subtropical and humid. Here are some important features of the climate:

### Temperature:

**Summer:** The temperatures can be quite high during the summer months, typically ranging from 30°C to 40°C (86°F to 104°F).

**Winter:** Winters are milder than in the higher Himalayan regions, with temperatures often ranging from 10°C to 20°C (50°F to 68°F). Frost can occasionally form in the early mornings.

**Monsoon:** The Terai region receives a lot of rain during the monsoon season, which typically lasts from June to September. Rainfall varies, although it normally ranges between 1,200 and 2,000 mm (47 to 79 inches) every year. This significant rainfall helps to sustain the region's lush vegetation and agricultural activity.

**Humidity:** The region gets high humidity levels throughout year, particularly during the monsoon season. Humidity levels can regularly surpass 80% during and after rains, resulting to wet and marshy conditions.

**Seasons:** The climate is separated into three major seasons: summer, monsoon, and winter. Each season provides its own set of weather patterns, which impact local agriculture and daily life.

Overall, the Terai region's climate promotes diversified ecosystems, abundant flora and wildlife, and high agricultural output.

The Terai region of Uttarakhand is recognized for its excellent soil and favorable climate, making it ideal for a variety of agricultural pursuits. The main crops farmed in this region are:

**Rice:** Rice, one of the most important staple crops, is widely grown due to the abundant water supply from the region's rivers and high humidity.

**Wheat:** Wheat, an important grain crop, is grown during the cooler winter months.

**Sugarcane:** The climate of the Terai region is ideal for growing sugarcane, which is used to create sugar and other byproducts.

**Maize (Corn):** Maize is farmed for both human consumption and cattle feed.

**Pulses:** Various pulses, such as chickpeas, lentils, and peas, are grown for their protein content and soil enhancement.

**Oilseeds:** Crops like soybeans and sunflower are grown for their oil and as rotational crops.

**Fruits and Vegetables:** The region's favorable growing conditions allow for the cultivation of a wide range of fruits and vegetables, including tomatoes, potatoes, cucumbers, and melons.

**Legumes:** In addition to pulses, the Terai region grows other legumes such as beans and lentils. The Terai region is agriculturally productive due to its fertile alluvial soil, abundant river water supply, and generally warm climate. Crops grown here help local consumption as well as the regional economy.

## B. Bhabar Region

**Location:** The Bhabar region is located in the foothills of the Siwalik Hills, directly to the north of the Terai region. It covers sections of Uttarakhand and Uttar Pradesh in India, as well as western Nepal. The Bhabar region is a geographical area in northern India that includes the state of Uttarakhand. It is located near the Himalayan foothills, just south of the Shivalik Hills.

The Bhabar region is located in the foothills of the Siwalik Hills, just to the north of the Terai region. It covers sections of the Indian states of Uttarakhand and Uttar Pradesh, as well as western Nepal. The Bhabar region is a geographical area in northern India that includes the state of Uttarkhand. It is located in the Himalayan foothills, south of the Shivalik Hills.

The Bhabar region is noteworthy for its role in groundwater recharge and has a unique environment when compared to higher Himalayan locations. It is particularly important for agriculture and settlement because its soil is very fertile in comparison to other sections of the state. The climate of the Bhabar region in Uttarakhand differs from that of the Terai and other regions due to its unique geographical location and topography. Here's an overview of climate in the Bhabar region:

### Temperature:

**Summer:** Summers in the Bhabar region are relatively warm, with temperatures ranging from 25°C to 35°C (77°F-95°F). The heat might be more intense than in higher altitudes of Uttarakhand.

**Winter:** Winters are chilly, but not as harsh as in the upper Himalayan highlands. Temperatures typically range from 10°C to 20°C (50°F to 68°F), with occasional colder nights.

**Monsoon:** The Bhabar region receives moderate to heavy rainfall during the monsoon season, which lasts from June to September. The average annual rainfall in this region is between 1,000 and 1,500 mm (40 and 59 inches). Rainfall helps to support the region's vegetation and agriculture, but it can also cause seasonal flooding in certain locations.

**Humidity:** Humidity levels in the Bhabar region range from moderate to high, especially during the monsoon season. The humidity is lesser than in the Terai, but still perceptible.

**Seasons:** The climate of the Bhabar region is characterized by distinct seasonal changes: a hot summer, a rainy monsoon, and a cool winter. Each season impacts agricultural practices and the local environment differently.

**General Characteristics:** The Bhabar region is distinguished by its sandy and gravelly soil, which determines its climate and hydrology. Because of its proximity to the Himalayan foothills, the region can receive climatic impacts from both the Himalayas and the subtropics.



Overall, the Bhabar region's environment supports a diverse range of plants and is critical for agriculture, despite being less humid than the Terai region and having differing temperature ranges. The Bhabar region in Uttarakhand, known for its sandy and gravelly soil and location in the foothills of the Himalayas, supports a variety of agricultural activities. Crops grown here are suited to the region's climate and soil conditions.

**Wheat:** Wheat is a key crop in the Bhabar region, and it is farmed during the cooler winter months. Wheat cultivation is well-suited to the region's climate and soil conditions.

**Rice:** Rice is still farmed in some places of the Bhabar region with irrigation, despite being less prevalent than in the Terai region. It is grown largely in locations with an adequate water supply.

**Maize (Corn):** Maize is another prominent crop farmed in the Bhabar region, which benefits from the area's mild climate and soil characteristics.

**Pulses:** The Bhabar region is home to a variety of pulse crops, including chickpeas, lentils, and peas. These crops are valuable because of their protein content and soil fertility.

**Oilseeds:** Oil-producing crops include mustard and sunflower. These are ideal for the Bhabar region's soil and climate conditions.

**Vegetables:** The location encourages the development of many vegetables, including potatoes, tomatoes, and onions. The generally temperate temperatures and soil conditions make vegetable production ideal.

**Fruits:** Some fruits, including as guavas and citrus fruits, are cultivated in the Bhabar region, though fruit farming is less common than in other locations.

**Fodder Crops:** Given the agricultural emphasis on producing both food and feed, a variety of fodder crops are planted to support local cattle.

The Bhabar region's distinct soil and climatic conditions mean that, while it is less productive for some crops than the Terai region, it nonetheless supports a wide range of agricultural activity. Adaptation to local conditions is critical for successful farming in this location.

## **Agricultural Practices**

**1. Terrace Farming:** Because of the hilly terrain, terrace farming is common. Farmers develop step-like fields on slopes to reduce soil erosion and make better use of available space. Terrace farming is the process of establishing stepped levels or terraces on sloped terrain in order to prevent soil erosion, manage water flow, and produce flat cultivable fields. Historical context in the activity has historic roots in the region, with traditional methods evolving throughout time to meet the limitations of rocky terrain.

**2. Organic Farming:** Organic farming is becoming more popular, owing to both traditional methods and increased awareness of health and sustainability issues. Organic farming is an agricultural practice that does not use synthetic chemicals, fertilizers, or pesticides. Instead, it uses natural processes and materials to improve soil fertility, control pests, and grow crops, including compost, green manure, and organic amendments. Overall, organic farming in Uttarakhand is a viable option for sustainable agriculture that benefits both the environment and local residents. With continuous support and innovation, it has the potential to make substantial contributions to the state's agricultural and economic development.

**3. Crop Rotation and Mixed Farming:** Crop rotation is a common strategy among farmers to preserve soil fertility and reduce insect populations. Mixed farming, which combines agricultural cultivation and livestock rearing, is also practiced.

Crop rotation entails systematically altering the type of crops cultivated on a specific plot of land over multiple growing seasons. This approach aids in soil fertility management, as well as pest and disease control.

Crops have different nutrient requirements and contributions. For example, legumes (like pulses) can fix nitrogen in the soil, enriching it for future crops.

Crop rotation serves to prevent depletion of certain nutrients, which can occur with continuous farming. Crop rotation and mixed farming are critical components of sustainable agriculture in Uttarakhand. These techniques help to maintain soil health, manage pests and diseases, and optimize resource use, making them critical for the region's agricultural productivity and environmental sustainability. Mixed farming combines crop cultivation and livestock rising on the same land. This integrated approach aids in optimizing resource utilization and increasing farm productivity. Animal dung is used as an organic fertilizer to enhance the soil for crops.

**4. Agro forestry:** Agro-forestry, which combines forestry and agriculture, helps to conserve soil while also providing additional income through the sale of timber and non-timber forest products. Agro-forestry is a land-use management strategy in which trees or shrubs are planted in or near crops or pastureland. With its unique topography and climate, Uttarakhand agro-forestry plays an important role in increasing agricultural output, promoting soil health, and maintaining ecological balance. This is an overview of agro-forestry activities in Uttarakhand. Agro-forestry incorporates trees and bushes into agriculture.

Agro-forestry in Uttarakhand provides several benefits to agriculture, the environment, and local residents. Agro-forestry may make a substantial contribution to the state's sustainable land management and rural development by solving obstacles and leveraging government and institutional support.

**5. Water Management:** Due to the fluctuating availability of water, both ancient irrigation technologies such as channelized mountain streams and newer techniques such as drip irrigation are used. Water management in Uttarakhand is critical due to the state's unique geography, changing climatic conditions, and the need of water resources for agriculture, drinking, and ecological balance. Effective water management methods are required to solve issues such as water scarcity, seasonal fluctuations, and the protection of natural water resources. This is a detailed review of water management in Uttarakhand.

## **Rural Livelihoods and Socio Economic Challenges**

Uttarakhand rural life and socioeconomic issues highlight the complexities of managing development in a state with different topography, climatic circumstances, and socio-cultural dynamics. Here's an overview of the important components of rural livelihoods and the socioeconomic issues confronting the region:

### **A. Rural Livelihoods**

#### **1. Agriculture**

Agriculture is the principal source of income for many rural people, and it includes the production of crops such as rice, wheat, maize, legumes, and fruits.

**Terrace Farming:** Terrace farming is a typical practice in hilly terrain to optimize land usage and manage water supplies.

#### **2. Animal Husbandry:**

**Dairy Farming:** Dairy farming has long played a significant role in agriculture. India is mostly an agrarian economy with 70% of the population living in villages, where livestock play a significant part in socio-economic development. Livestock produce high-quality meals, including milk, cheese, butter, and ghee. India is a leading producer of milk and the world's largest consumer of milk products. To meet internal demand, we must import considerable amounts of milk due to a supply shortage.

**Poultry and Goat Farming:** Poultry and goat farming are also significant, providing meat and other products.

#### **3. Forestry:**

**Forest Resources:** Rural communities frequently rely on forests for fire wood, fodder, and the collection of non-timber forest products including medicinal plants, mushrooms, and berries.

#### 4. Handicrafts and Traditional Skills:

**Crafts:** Traditional crafts such as wool weaving, wood carving, and ceramics help to sustain rural communities while also preserving cultural heritage.

#### 5. Tourism:

**Eco-Tourism and Pilgrimage:** Uttarakhand natural beauty and religious monuments attract visitors, creating opportunities for revenue through lodging, guide services, and local crafts.

#### 6. Migration:

**Out-Migration:** Many rural citizens relocate to cities or other states in quest of better job possibilities, particularly among the younger population.

## 2. Socio-Economic Challenges

### 1. Economic Challenges:

**Income Inequality:** Rural communities frequently have considerable income gaps, with wealth concentrated in certain sectors or among specific populations.

**Limited Employment Opportunities:** Employment opportunities in rural areas are frequently restricted, resulting in reliance on agricultural and informal sector activities.

**Low Wages:** Workers in agriculture and informal sectors frequently receive low wages, impacting their standard of living.

### 2. Infrastructure Deficiencies:

**Road Connectivity:** Remote and hilly places may have limited road connectivity, limiting access to markets, healthcare, and education.

**Electricity and Water Supply:** Inadequate infrastructure for dependable electricity and clean water supply can stymie growth and quality of life.

### 3. Educational and Health Services:

**Limited Access:** Rural communities may have restricted access to quality education and healthcare services, resulting in inequities in health and educational outcomes.

**Infrastructure Gaps:** Schools and health facilities in remote areas may be under-resourced, affecting the quality of education and healthcare.

### 4. Environmental Challenges:

**Natural Disasters:** Rural communities may have restricted access to quality education and healthcare services, resulting in inequities in health and educational outcomes.

**Climate Change:** Climate change can have an impact on agricultural output and water supplies, which in turn affect rural life.

### 5. Land and Resource Management:

**Land Degradation:** Deforestation and inappropriate farming methods can cause soil erosion and land degradation reducing production and livelihoods.

**Resource Scarcity:** Competition over forest resources and water can spark conflict and have an influence on people's livelihoods.

### 6. Social Issues:

**Gender Inequality:** Women in rural locations may suffer gender inequality issues, such as limited access to resources, education, and decision-making power.

**Social Exclusion:** Marginalized communities, including Scheduled Castes (SCs) and Scheduled Tribes (STs), may face social marginalization and limited prospects.

The Uttarakhand government, in collaboration with different central government initiatives, runs a number of projects and programs aimed at boosting rural development, increasing livelihoods, and improving the quality of life in rural regions. Here is a summary of significant government schemes and efforts for rural development in Uttarakhand:

## Government schemes Initiatives for rural development of Uttarakhand

### Central Government Schemes

#### 1. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA):

**Objective:** In September 2005, the Indian government passed the Mahatma Gandhi National Rural Employment Guarantee Act. This action every rural household with adult members ready to conduct unskilled manual labor receives a legislative guarantee of 100 days of paid employment each year.

**Impact:** Improves livelihood security, produces long-term assets, and encourages rural infrastructure development.

**2. Pradhan Mantri Gram Sadak Yojana (PMGSY):** The Pradhan Mantri Gramme Sadak Yojana (PMGSY) was introduced by the Government of India as part of its poverty reduction strategy to link unconnected habitations. To ensure the long-term management of India's rural road network, the government is working to establish high and uniform technical and management standards, as well as to facilitate policy formation and planning at the state level. According to the most recent statistics provided by state governments from the survey performed to identify the core network as part of the PMGSY plan, roughly 167 lakh disconnected habitations are eligible for coverage under the programme.

**Impact:** Improves mobility, lowers transportation costs, and boosts economic activity in remote areas.

#### 3. National Rural Employment Guarantee Scheme (NREGS):

**Objective:** In September 2005, the Indian government passed the Mahatma Gandhi National Rural Employment Guarantee Act. The Act provides a legal guarantee of a hundred days of wage employment in a fiscal year to adult members of a rural household who seek employment and are willing to do unskilled manual labor; and it ensures sustainable livelihoods through wage employment, with a focus on the creation of long-term assets and infrastructure.

**Impact:** Creates jobs, develops infrastructure, and funds rural development projects.

#### 4. National Rural Health Mission (NRHM):

**Objective:** On April 12, 2005, the National Rural Health Mission (NRHM) was inaugurated with the goal of providing accessible, inexpensive, and high-quality health care to the rural population, particularly disadvantaged groups. NRHM is to deliver equitable, inexpensive, and high-quality health care to rural communities, particularly the most vulnerable people; improves

rural healthcare delivery systems by increasing access to high-quality healthcare services and infrastructure.

**Impact:** Improves maternal and child health, reduces disease burden, and strengthens health systems in rural areas.

### **5. Pradhan Mantri Awas Yojana – Gramin (PMA Y-G):**

**Objective:** The Pradhan Mantri Gramin Awas Yojana (literally, 'Prime Minister's Rural homes Scheme') is a social welfare project run by the Ministry of Rural Development of the Government of India that provides homes to India's rural poor. A comparable initiative for the urban poor, called Housing for All by 2022, was begun in 2015; Funds the construction of pucca dwellings for homeless and low-income households in rural areas.

**Impact:** Enhances housing conditions and promotes sustainable rural housing.

### **6. Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY):**

**Objective:** The Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) is a skilling and placement project of the Ministry of Rural Development (MoRD), Government of India. DDU-GKY is based on the Aajeevika Skills programme and the Swarnjayanti Gramme Swarozgar Yojana's 'Special Projects' component; Focuses on improving the employability of rural adolescents through skill training and job placement assistance.

**Impact:** Improves employment opportunities for rural youth, contributing to poverty alleviation.

### **7. Integrated Rural Development Programme (IRDP):**

**Objective:** In 1978, the Indian government established the Integrated Rural Development Programme (IRDP), which was implemented in 1980. The program's purpose is to provide underprivileged persons with job opportunities as well as opportunities to expand their skill sets in order to improve their living conditions. Through different subsidy schemes and financial aid, the goal is to create jobs and raise the incomes of the rural poor.

**Impact:** Enhances income levels and supports economic development in rural areas.

### **8. National Rural Drinking Water Programme (NRDWP):**

The primary objective of NRDWP is to provide every rural person with adequate safe water on a sustainable basis, for basic domestic needs such as cooking, drinking. Under the programme, water was supplied with a minimum quality standard, which is conveniently accessible at all

times and in all situations; ensures the provision of safe and adequate drinking water in rural areas.

**Impact:** Improves health and sanitation by ensuring access to clean drinking water.

## 2. State Government Schemes and Initiatives

### 1. Uttarakhand State Rural Employment Guarantee Scheme (USRGS):

**Objective:** The Government of India passed the Mahatma Gandhi National Rural Employment Guarantee Act, 2005 in September, 2005. The Act gives legal guarantee of a hundred days of wage employment in a financial year to adult members of a rural household who demand employment and are willing to do unskilled manual work. State-specific employment guarantee scheme that provides wage employment and supports rural infrastructure development.

**Impact:** In addition to MGNREGA, this initiative will improve local jobs and infrastructure.

### 2. Uttarakhand Rural Development and Self-Employment Scheme (URDSES):

**Objective:** "To reduce poverty by enabling the poor households to access gainful self-employment and skilled wage employment opportunities, resulting in appreciable improvement in their livelihoods on a sustainable basis, through building strong grassroots institutions of the poor." The Ministry of Rural Development launched the Swarnjayanti Gramme Swarozgar Yojana (SGSY) to help low-income families in rural areas start their own businesses. The Central Government funds the scheme; Encourages self-employment and entrepreneurship among rural residents through financial assistance and training.

**Impact:** Encourages rural entrepreneurship and improves livelihood opportunities.

### 3. Uttarakhand Swachh Bharat Mission (Gramin):

**Objective:** The Honorable Prime Minister launched the program in 2014 with the goal of making India open defecation-free. This vast initiative was successful in mobilizing nationwide participation, making it the world's greatest behavioral change campaign. Its objective is to enhance rural sanitation by implementing solid and liquid waste management practices and ensuring that villages are open defecation-free. It attempts to enhance rural sanitation coverage and eliminate open defecation.

**Impact:** Enhances public health and sanitary infrastructure in rural communities.

### 4. Uttarakhand Agricultural Development Program:

**Objective:** Integrated Livelihood Support Project (ILSP), is a joint initiative of Government of Uttarakhand and International Fund for Agriculture Development (IFAD) and being



implemented in Uttarakhand in 44 blocks of 11 hill districts under the Rural Development department. Under Maun Palan Uttarakhand, the state government will provide an 80% subsidy to youths who produce honey by beekeeping. Under the Maun Palan Yojana Uttarakhand, the government will build honey villages at the panchayat level in various districts. Provides support for agricultural development through subsidies, training, and infrastructure improvements.

**Impact:** Increases agricultural output and promotes sustainable farming techniques.

#### **5. Hilly States Development Program:**

**Objective:** Addresses hilly regions' specific difficulties, such as infrastructure development, soil conservation, and sustainable land management.

**Impact:** Promotes balanced growth and meets the unique needs of hilly terrain.

#### **6. Chief Minister's Development Scheme for Rural Areas:**

**Objective:** The program focuses on providing financial and infrastructure support for rural development, such as roads, schools, and healthcare facilities.

**Impact:** Improves overall rural infrastructure and quality of life.

#### **7. Rural Women Empowerment Program:**

**Objective:** The Ministry is implementing Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY - NRLM) across the country (except Delhi and Chandigarh) with the objective of organizing rural poor women into Self Help Groups (SHGs) and continuously nurturing and supporting them until they achieve an appreciable increase. The goal is to empower rural women by developing skills, increasing financial literacy, and supporting self-help organizations.

**Impact:** Promotes gender equality, expands women's economic prospects, and fosters communal development.

#### **8. Forest Development and Management Scheme:**

**Objective:** Forest management is a branch of forestry concerned with overall administrative, legal, economic, and social aspects, as well as scientific and technical aspects, such as silviculture, forest protection, and forest regulation; Promotes sustainable forest management and conservation, benefiting rural communities dependent on forest resources.

**Impact:** Improves forest conservation and sustains livelihoods based on forest products.

### 3. Community-Based Initiatives

#### 1. Self-Help Groups (SHGs):

**Objective:** Encourages the development of self-help groups (SHGs) to provide financial aid, training, and support to rural women and marginalized groups.

**Impact:** Empowers women, encourages savings and credit, and fosters rural business.

#### 2. Cooperatives:

**Objective:** Encourages the formation of cooperatives for agriculture, dairy, and other sectors to enhance collective economic activities.

**Impact:** Improves market access, resource sharing, and income generation for rural communities.

#### 3. Local NGOs and Civil Society Organizations:

**Objective:** Implement grassroots development programs and activities that meet specific local needs and concerns.

**Impact:** Offers focused assistance and interventions for rural development, education, health, and livelihoods.

---

## 5.4 SUMMARY

---

The government has developed a number of plans and programs to help agriculture in Uttarakhand, such as crop input subsidies, irrigation facility construction, and organic farming support. In addition, initiatives are underway to modernize agricultural infrastructure and offer farmers with better market access.

Overall, agriculture in Uttarakhand is an important element of the state's economy and culture, with techniques tailored to the region's specific geographical and climatic conditions.

The implementation of new technology and innovations in crop management and livestock production will increase the efficacy of these techniques. Crop rotation and mixed farming are critical components of sustainable agriculture in Uttarakhand. These techniques help to maintain soil health, manage pests and diseases, and optimize resource use, making them critical for the region's agricultural productivity and environmental sustainability.

Agro-forestry in Uttarakhand provides several benefits to agriculture, the environment, and local residents. Agro forestry may make a substantial contribution to the state's sustainable land management and rural development by solving obstacles and leveraging government and institutional support.

While Uttarakhand confronts a number of socioeconomic challenges, there are several potential to enhance rural livelihoods and address these issues through focused development programmes, infrastructural upgrades, and community engagement. Balancing economic growth with environmental sustainability and social inclusion will be critical in promoting long-term development in the region.

The Uttarakhand government, in collaboration with the central government, has initiated a number of projects aimed at boosting rural development, improving livelihoods, and tackling socioeconomic concerns. Continued efforts to improve implementation, raise awareness, and assure sustainability will be critical to meeting long-term rural development objectives.

---

## 5.5 GLOSSARY

---

**Terrace farming:** Terrace farming is a way of farming in mountainous locations where crops are cultivated on flat platforms built into the slopes of hills to reduce soil erosion and better manage water. This is frequent in Uttarakhand due to its steep landscape.

**Maize:** Maize (Corn) is a staple crop in Uttarakhand, particularly at lower altitudes. Maize is grown as a primary food and fodder crop.

**Potato:** A significant crop in Uttarakhand, particularly at higher elevations where the cooler environment allows for its cultivation.

**Barley:** Barley, which is widely grown in Uttarakhand's highest elevations, thrives in the cooler climate and less productive soils of the Himalayan foothills.

**Horticulture:** The branch of agriculture that deals with the cultivation of fruits, vegetables, and ornamental plants. In Uttarakhand, horticulture includes the cultivation of apples, peaches, and plums.

**Agro-forestry:** An integrated approach of using the interactive benefits from combining trees and shrubs with crops and/or livestock. This practice is encouraged in Uttarakhand to enhance soil fertility and reduce erosion.

**Handicrafts:** Traditional craftwork produced by rural artisans, including weaving, wood carving, and embroidery, which is a significant source of income in Uttarakhand.

**Sericulture:** The production of silk through the cultivation of silkworms. This is a traditional livelihood activity in some parts of Uttarakhand.

**Traditional Livelihoods:** Occupations and activities that have been practiced by rural communities for generations, including agriculture, animal husbandry, and handicrafts.

**Rural Tourism:** Tourism activities in rural areas aimed at showcasing local culture and traditions, which can provide additional income sources for rural households in Uttarakhand.

**Soil Erosion:** The removal of the top layer of soil by wind or water, which is a significant problem in the hilly regions of Uttarakhand, impacting agricultural productivity.

**Educational Access:** The availability and accessibility of educational institutions and resources, which can be limited in remote and rural areas of Uttarakhand.

**Healthcare Infrastructure:** The network of health facilities and services available in rural areas, which may be inadequate or underdeveloped in Uttarakhand.

**Rural-Urban Migration:** The movement of people from rural areas to urban centers in search of better employment opportunities, often resulting in a decrease in the rural workforce.

**Pradhan Mantri Fasal Bima Yojana (PMFBY):** A government scheme providing crop insurance to protect farmers against losses due to natural calamities, pests, and diseases. This scheme is important for farmers in Uttarakhand to mitigate agricultural risks.

**Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA):** A legal guarantee for at least 100 days of wage employment in a financial year to every rural household whose adult members volunteer to do unskilled manual work. It helps in providing employment and supporting rural livelihoods in Uttarakhand.

**Pradhan Mantri Gram Sadak Yojana (PMGSY):** A program aimed at improving rural road connectivity to enhance access to markets, healthcare, and education facilities, thereby supporting rural development in Uttarakhand.

**Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY):** A scheme focusing on providing skills and employment opportunities for rural youth, helping them secure better job prospects and improving their livelihoods.

**National Rural Employment Guarantee Scheme:** A program providing employment opportunities in rural areas, which is critical for addressing unemployment and poverty in Uttarakhand.

**National Rural Health Mission (NRHM):** A program designed to provide accessible, affordable, and quality healthcare to the rural population, addressing healthcare challenges in Uttarakhand.

---

## 5.6 ANSWER TO CHECK YOUR PROGRESS

---

**1. Which of the following is a primary cropping pattern followed in Uttarakhand?**

- A. Rice-Wheat
- B. Sugarcane-Pulses
- C. Maize-Potato
- D. Cotton-Soybean

Answer: C.

**2. In Uttarakhand, the practice of growing crops on terraced fields is most commonly associated with which of the following crops?**

- A. Rice
- B. Wheat
- C. Barley
- D. Pulses

Answer: C.

**3. Which of the following is a significant challenge to agriculture in the hilly regions of Uttarakhand?**

- A. Soil salinity
- B. Water logging
- C. Soil erosion
- D. Low temperatures

Answer: C

**4. In Uttarakhand, a common supplementary source of income for rural households, apart from agriculture, is:**

- A. Mining
- B. Handicrafts
- C. Industrial manufacturing
- D. Large-scale commercial fishing

Answer: B

**5. Which traditional activity is a major component of rural livelihood in Uttarakhand's hill regions?**

- A. Rubber tapping
- B. Floriculture
- C. Sericulture (silk production)
- D. Tea cultivation

Answer: C

**6. Which of the following is a major socio-economic challenge faced by rural communities in Uttarakhand?**

- A. High urban migration rates
- B. Overpopulation of urban areas
- C. Lack of access to educational facilities
- D. Excessive industrial pollution

Answer: C

**7. A significant challenge in the health sector for rural areas in Uttarakhand is:**

- A. High urban healthcare standards
- B. Inadequate healthcare infrastructure
- C. Excessive healthcare costs

D. Overcrowding in healthcare facilities

Answer: B.

**8. Which government scheme aims to enhance the livelihood of rural farmers in Uttarakhand through improved agricultural practices and income support?**

A.) Pradhan Mantri Fasal Bima Yojana (PMFBY)

B.) Swachh Bharat Mission

C.) Atal Pension Yojana

D.) MGNREGA

Answer: A

**9. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) primarily provides:**

A. Health insurance for rural families

B. Subsidies for agricultural inputs

C. Guaranteed wage employment for rural households

D. Educational scholarships for rural students

Answer: C

**10. Which initiative aims to improve the infrastructure and connectivity of rural areas in Uttarakhand?**

A) National Rural Employment Guarantee Scheme

B) Pradhan Mantri Gram Sadak Yojana (PMGSY)

C) Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)

D) Rural Self Employment Training Institutes (RSETIs)

Answer: B

---

## 5.7 REFERENCES

---

Microsoft Word - draft Krishi Niti 2018 (uk.gov.in)

उत्तराखण्ड की मृदा और कृषि | Soil and Agriculture of Uttarakhand in Hindi - Knowledge Baba (knowledge-baba.com)

Dr. S.C. Kharkwal, Regional Geography of Himalaya, Winsar Publishing Co. Dehradun.

Uttarakhand Department of Agriculture

Agricultural Statistics, Uttarakhand

Uttarakhand State Action Plan on Climate Change

---

## 5.8 TERMINAL QUESTIONS

---

### (A) Long Questions

1. Discuss the impact of terrace farming on agricultural productivity and soil conservation in Uttarakhand. How does this practice address the challenges posed by the region's hilly terrain?
2. Analyze the major cropping patterns in Uttarakhand and their adaptation to the region's diverse climatic and soil conditions. How do these patterns affect the local economy and food security?
3. Evaluate the role of traditional handicrafts and sericulture in enhancing rural livelihoods in Uttarakhand. What are the challenges and opportunities associated with these practices?
4. Discuss the impact of rural tourism on the socio-economic development of Uttarakhand's rural areas. What are the potential benefits and drawbacks of this industry for local communities?
5. Examine the major socio-economic challenges faced by rural communities in Uttarakhand. How do these challenges affect overall development and quality of life in these areas?
6. Evaluate the effectiveness of the Pradhan Mantri Gram Sadak Yojana (PMGSY) in improving rural infrastructure in Uttarakhand. What are the key achievements and limitations of this scheme?
7. Analyze the impact of the Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) on youth employment in Uttarakhand. What are the successes and areas for improvement in this scheme?



**(B) Short Questions**

1. What is a common method used in Uttarakhand to prevent soil erosion on hilly terrain?
2. Name two major crops grown in the lower altitudes of Uttarakhand.
3. Which crop is particularly suited to the higher altitudes and cooler climate of Uttarakhand?
4. Why is barley an important crop in the higher regions of Uttarakhand?
5. How does agro-forestry benefit farmers in Uttarakhand?
6. What traditional craft is significant for the rural economy in Uttarakhand?
7. How does sericulture contribute to rural livelihoods in Uttarakhand?
8. What is one advantage of rural tourism for the communities in Uttarakhand?
9. What are traditional livelihoods in Uttarakhand primarily based on?
10. What is a major challenge to agriculture in the hilly regions of Uttarakhand?
11. What issue often limits educational access in remote areas of Uttarakhand?
12. Which socio-economic problem is exacerbated by the migration of people from rural to urban areas?
13. How does inadequate healthcare infrastructure affect rural communities in Uttarakhand?
14. What does the Pradhan Mantri Fasal Bima Yojana (PMFBY) provide to farmers in Uttarakhand?
15. How does MGNREGA support rural households in Uttarakhand?
16. What is the main objective of the Pradhan Mantri Gram Sadak Yojana (PMGSY)?
17. What does the Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) focus on?
18. How does the National Rural Health Mission (NRHM) aim to improve healthcare in rural areas?

---

## **UNIT- 6: ETHNIC DIVERSITY: INDIGENOUS COMMUNITIES, LANGUAGES, AND TRADITIONS**

---

### **6.1 OBJECTIVES**

### **6.2 INTRODUCTION**

### **6.3 INDIGENOUS COMMUNITIES**

### **6.4 BHOTIA**

### **6.5 RAJI**

### **6.6 BOKSHA**

### **6.7 THARUS**

### **6.8 JAUN SAR BABAR**

### **6.9 SUMMARY**

### **6.10 GLOSSARY**

### **6.11 ANSWER TO CHECK YOUR PROGRESS**

### **6.12 REFERENCES**

### **6.13 TERMINAL QUESTIONS**

---

## **6.1 OBJECTIVES**

---

After reading this unit, you will be able to:

- Know about the Indigenous communities of Uttarakhand Himalaya.
- Understanding the Language and Traditions of the Bhotia, Raji, and Boksha Tribe of Uttarakhand.
- Gain knowledge about the Language and Traditions of Tharus, Jaunsar Babar Tribes of Uttarakhand.

---

## **6.2 INTRODUCTION**

---

Uttarakhand, a northern Indian state situated in the Himalayas, exemplifies a region characterized by significant ethnic diversity, primarily attributable to its indigenous populations, linguistic variety, and cultural traditions. This multifaceted diversity is indicative of the region's intricate historical narrative, geographical seclusion, and the myriad cultural influences that have contributed to its identity throughout the centuries. The indigenous communities within the state, including the Bhotias, Tharus, Jaunsaris, and Rang, each exhibit unique cultural practices, languages, and lifestyles that collectively enrich the distinctive cultural tapestry of Uttarakhand.

The Bhotias represent one of the most distinguished indigenous groups in Uttarakhand, predominantly residing in the elevated terrains adjacent to the Indo-Tibetan frontier. They are recognized for their traditional trade methodologies, particularly their historical engagement as trans-Himalayan merchants facilitating commerce between India and Tibet. The Bhotia community boasts a profound cultural legacy, characterized by specific religious customs, festivals, and rituals that are intricately connected to their ecological surroundings. Their ancestral knowledge concerning herbal medicine and sustainable animal husbandry practices is fundamental to their existence. Nevertheless, the recent socio-economic transformations and environmental adversities in the region have profoundly influenced their traditional vocations and cultural expressions.

The linguistic landscape of Uttarakhand mirrors the heterogeneity of its populace. The region encompasses numerous indigenous languages and dialects, many of which are exclusively associated with particular communities and geographic locales. For example, the Rang community utilizes the Rang language, which belongs to the Tibeto-Burman linguistic family. Likewise, the Jaunsari community, residing in the Jaunsar-Bawar area, communicates in a dialect that is notably distinct from the predominant languages spoken within the state. These languages serve not merely as communicative tools but also as vessels of cultural heritage, oral histories, and collective identity.

The customs of Uttarakhand's indigenous communities are profoundly intertwined with the natural environment and spiritual convictions. The Jaunsari people, for instance, possess a distinctive socio-religious structure that incorporates the practice of polyandry, which is infrequently observed in other regions of India. Their celebrations, including the Magh Mela and Bissu, are marked by traditional music, dance, and rituals that embody their agrarian lifestyle and intrinsic connection to the natural world. Similarly, the Tharus of the Terai region maintain rich traditions of folk songs, dances, and rituals, many of which are intricately linked to their agricultural practices and the rhythms of nature.

### **What is Ethnic Diversity?**

Ethnic diversity refers to the variety of cultural expressions, languages, traditions, and identities that exist within a given population or geographic area. It is a fundamental aspect of human societies, reflecting the complex histories, migrations, and interactions of different peoples over time. One of the most profound manifestations of ethnic diversity is found within indigenous communities, which are often the original inhabitants of a region and custodians of rich cultural heritages that have been passed down through generations.

### **What are Indigenous Communities?**

Indigenous communities represent a significant part of the world's ethnic diversity. These groups have distinct cultural identities, often characterized by unique languages, spiritual practices, social structures, and a deep connection to the land. Indigenous peoples maintain traditional ways of life that are closely linked to their environments, with knowledge systems that have been developed over centuries. This connection to their ancestral lands not only shapes their cultural practices but also their worldview, which is often rooted in sustainability and the stewardship of natural resources. However, indigenous communities have historically faced challenges such as displacement, marginalization, and the erosion of their rights, which threaten the preservation of their unique identities.

### **What is Language?**

Languages are a critical component of ethnic diversity and are particularly important within indigenous communities. Many of the world's indigenous languages are oral, passed down from generation to generation without a written form. These languages are not only means of communication but also carriers of cultural knowledge, history, and identity. Each language reflects a unique way of understanding the world, including local knowledge about flora, fauna, and ecological systems. Unfortunately, many indigenous languages are endangered due to the pressures of globalization, cultural assimilation, and the dominance of major languages. The loss of an indigenous language often signifies the loss of cultural heritage and traditional knowledge, making efforts to preserve and revitalize these languages vital.

### **What is Traditions?**

Traditions within indigenous communities are diverse and encompass a wide range of practices, including rituals, ceremonies, art, music, and dance. These traditions are integral to the social fabric of indigenous societies, reinforcing community bonds and cultural continuity. They often convey deep spiritual significance and reflect the community's relationship with the natural world. For example, many Indigenous traditions involve ceremonies that honour the seasons, the land, and the spirits of ancestors. These practices are not only cultural expressions but also serve as a means of passing down values, beliefs, and knowledge to younger generations. However, the continuity of these traditions is increasingly under threat from modernization, external cultural influences, and economic pressures.

---

### 6.3 INDIGENOUS COMMUNITIES

---

The contemporary landscape of Uttarakhand is characterized by a vibrant tapestry of life, wherein individuals hailing from diverse communities and religious backgrounds collectively contribute to the rich festival of existence. The indigenous inhabitants of Uttarakhand are representative of various tribes, each possessing unique and abundant cultural practices. Notable tribes within Uttarakhand encompass the Bhotias (also referred to as Shaukas), TribalsRangs, Tharus, Buxas, Jaunsaris, and Rajis (or Banrawats), in addition to indigenous groups such as the Mahigeers and Vangujjars [Van Gujjars].

The state of Uttarakhand is predominantly composed of five principal tribal communities, specifically Tharu, Buxa, Bhotia, Jaunsari, and Raji. These tribal populations are primarily located in the mountainous regions of Garhwal and Kumaun, particularly in areas such as Chakarata and Kalsi within the Dehradun district, as well as Rawain (Uttarkashi), Almora, Chamoli, Pithoragarh, Bageshwar, and Nainital. Each of these tribal communities possesses distinct socio-cultural traditions and is reliant on an agricultural and pastoral lifestyle, characterized by rudimentary forms of agricultural practices and livestock rearing. These indigenous tribes and communities have not only thrived in contemporary Uttarakhand but have also succeeded in preserving their rich cultural heritage and social traditions.

---

### 6.4 BHOTIA

---

The word 'Bhotiya' originates from the word 'Bhot'. The area forming the border with Tibet and Nepal was called 'Bhot-Pradesh'. goes. The name 'Bhotiya' is not a traditional or professional name but a Javanese address. But at present, only the original tribal residents of this area are called 'Bhotiya'. Sometimes these inhabitants are also known by the term 'Bhotatik'.

**Area of residence:** The main area of residence of the Bhotia tribe is the northern parts of the three border districts of Uttarakhand - Uttarkashi, Chamoli and Pithoragarh. Thus, their original habitat area is in the middle part of the Great Himalayas and Jaskar ranges in Uttarakhand. Although their habitat areas are separated from each other by high mountain ranges and glaciers, the habitat ecology is the same everywhere. Hence their areas are divided into valleys of river

valleys. Three such valleys are located in Garhwal Bhot-Pradesh and three valleys are located in Kumaon Bhot-Pradesh. The main valleys of Garhwal Bhot region are Janhavi (Jaad Valley), Saraswati (Mana Valley) and Dhauri (Neeti Valley). The main valleys of the Kumaon region are Gori (Johar Valley), Eastern Dhauri (Darma Valley) and Kuti (Beas Valley).

**Natural Environment:** The entire Bhotia region has extremely high and rugged terrain. The valley floor has steep mountain slopes on both sides. There is always snow in the higher areas. Along with this, due to frost action, the surface structure keeps disintegrating. Since ancient times, snowfall has made this Tibetan region a very rough and naked rocky mountain area. Many rivers originate from these snow-covered mountains, in whose valleys the Bhotia tribe resides.

**Physical structure:** Bhotiya tribe is a mixture of Tibetan and Mongolian castes. Their main physical characteristics are short stature, big head, round face, small eyes, flat nose, fair complexion, lack of hair on body and face, thick and heavy eyelids etc.

**Habitat:** They have seasonal habitats at different altitudes. According to the season, they keep roaming from one place to another with their herds of sheep and goats. Therefore their two main and permanent Summer settlements are called 'Mait' and winter settlements are called 'Gunda'. There are many Bhotiya settlements in the Chamoli district whose residents do not migrate even in winter like Meerg, Parasari, Satradhar, Raigaon, Lamling, Subai, Jugju etc. Most of their houses are double-storeyed and made of wood.

**Social Organization** Bhotia society is considered more organized and disciplined. The elders of the family are given great respect. They have their social traditions which if not followed, they are thrown out of society. The property is divided while the father is alive. Women also have rights like men. In these, marriage relations are strong but no place is given to freedom. These people are followers of the Hindu religion. The arrival of Ashadh is celebrated with great enthusiasm which is called 'Jeth-Pujai'. Apart from this, the festival of Birvodi (Vaisakhi) is considered important. Almost all festivals are celebrated in the same way as Hindus. On festivals, collective songs and dances are performed at night.

**Clothing:** Bhotiya Male Wear a woollen coat, pyjama, woollen cap and basket. Shepherds (Anwal) often wear drunk. Home-made white woollen coats are worn with great sorrow. They wear a woollen muffler around their neck and a woollen shawl or 'Pankhi' in winter. Women wear 'Pakhi' or a woollen blanket-like cloth (Lava). A white dhoti (turban) is tied around the waist. Young women wear black lava jeans. 'Angri' is worn outside the blouse. A sufficiently circular skirt is worn from inside the lava. Women tie a cloth on their heads. Unmarried and widowed women tie a towel, turban or woollen sheet around their head, while married women wear 'Ghunti' (white coloured cloak) with a 'Chhyak' (strap of a bright goatee) on their head. The main ornaments of women are silver sheeshphool, 'murali' (earrings) in the upper part of the ears and earrings (earrings) in the lower part, neckband, silver collar, jhanya locket, mangalsutra, suni-sandal etc. Apart from this, they wear paunchi, bangles, bangles on their wrists, Pauta,

Lachhya, Jhingori, Paulya (scorpion) and anklets on their feet. Older women wear garlands of precious stones around their necks.

In these, the marriage ceremony is performed completely according to the Vedic tradition. The wife goes to her husband's house after marriage. Rishta is usually sent from the groom's side. Then 'Saido' (engagement) takes place. Marriages are mostly done in winter settlements only. On the occasion of marriage, they perform 'Pauna-dance' with handkerchief in their hands. Alcohol is consumed heavily, and widows and child marriages do not take place.

There are only two classes in the Bhotiya caste, Kshatriya and Harijan. These people are fatalistic and superstitious. By nature, they are fearful and religious. 'Bhumiya Devta' is established in every village. 'Sadwa' and 'Vidhwa' are the guardian deities of their pastures. At every step, sheep and goats are sacrificed to drive away ghosts.

• **Economic occupation:** Animal husbandry and cottage industry constitute the primary livelihoods of this demographic. These individuals maintain herds comprising sheep, horses, a limited number of cows, and yaks, and to ensure their protection, they employ robust canines of a distinguished breed known as 'Bhootiya dogs.' There exist two distinct forms of seasonal migration among these populations: the first entails the movement of animal herds under the guidance of designated shepherds, while the second involves the migration of entire families alongside their livestock. During the months of October and November, inhabitants of elevated terrains relocate with their animals to the valleys, subsequently returning to their mountainous habitats in February and March.

In addition to the rearing of sheep and goats, the Bhotia community engages in the operation of cottage industries. These industries typically encompass three categories: 1. Home-based industries (including grain grinding, oil extraction, construction, and rope fabrication), 2. The wool industry, and 3. The liquor industry. Distillation of liquor occurs in each Bhotia village, intended for offerings to ancestors and deities, as well as to meet local demands. Initially, the production of liquor was perceived as a communal and social endeavor; however, in contemporary times, it has evolved into an industry that surpasses mere familial consumption. Agricultural activities are conducted primarily to uphold traditional practices, given the limitations and low fertility of arable land. The principal crops cultivated in this region include barley, ua, farfar, potatoes, jhangora, manduva, kauni, amaranth, and a minor quantity of paddy. The Bhotiya tribe is historically recognized as a trading community. Prior to the India-China conflict of 1962, the Bhotiya populace frequented Tibetan markets to vend their goods and would return with commodities such as wool and honey from Tibet. Currently, these individuals engage in trading wool and related products within the Indian market context. The Scheduled Tribe reservation policy instituted by the government has conferred significant advantages upon the Bhotiya tribe in contemporary society. Many among this populace are employed in various government positions. Furthermore, economically disadvantaged Bhotia individuals sustain their livelihoods through labor and the transportation of goods via horses and mules.



The linguistic framework of the Bhotia tribe is categorized as a Mon-Khmer language, which has its roots in the amalgamation of Tibeto-Burmese and Cambodian linguistic elements.

Radrunkash or Shaukukhun is prevalent in the Johar Valley, Vyansi is spoken in the Vyas Chaudans Valley, and the Darmi dialect is utilized in the Darma Valley. The influence of Aryan languages is evident within their linguistic structure.

In small or big societies, there are certain rules for the social system. If any member of the society violates these rules, then it is termed as a social crime. For this, there is also a provision for a punishment system in society. The law here is a mixture of rights and duties that are meant for mutual behavioural rules. These are interdependent in social and economic activities. There are village panchayats here, whose head is the Pradhan, through whom property transfer and family disputes are settled. But gradually these are also turning towards the courts. When dissatisfied with the justice of the Pradhan, these people started taking refuge in the court.

This society is very aware in terms of educational development and expansion. These people, who have been dependent on trade and agriculture since the past, are convinced that these activities are the only means of livelihood but cannot keep pace with civilized society. They are semi-nomads, due to which there is a problem of accommodation during cold weather. This society is more aware than other tribes of Uttarakhand.

---

## 6.5 RAJI

---

The Raji tribe residing in Pithoragarh district of Uttarakhand state across the border of India and Nepal in the complex geological and climatic system of the Himalayas attracted the attention of the Indian government due to its distinct culture, due to which it was declared a primitive community along with the Bhoksa tribe in 1967. They mainly reside in Dharchula, Didihat and present Champawat district with minimal needs. At present, their population is about 500. Raji society is a unique society that resides in dense forests and high hills.

This tribe, which resides in a dense forest area and makes a living on the products produced from it, is also called Banravat or Vankanhaiya. Based on folklore, it is clear that the northern part of Pithoragarh was ruled by the descendants of Eskat. Due to mutual differences, one of their brothers was given the forest kingdom, whose descendants are currently called Raji or Vanravat. The forest area was uneven and devoid of resources, due to which they could not develop. Living in the fierce storms of nature, they have protected their existence to date.

The Raji tribe is of Kirat descent which came and settled in the Himalayas in the past and adjusted itself according to the environment. The Raji people with physical characteristics like fair complexion, straight nose, black eyes, short height, small skull etc. use the Burma-Tibetan language. But at present, they have also started using Kumaoni and Hindi languages. The influence of the original language is reflected in the pronunciation of the words.



They build small houses on the slopes of the mountains by making stone walls and roofing them with the help of wood and leaves. These houses are shaped like caves. Their houses are in dense forests. The construction of the houses and their nature clearly show that they are solitary. At the same time, the effect of the environment is also reflected in their housing culture. To protect themselves from the cold, they build special types of houses or live in caves

The Raji tribe is a forest collector. These people consume fruits and tubers produced in the forest as food. Apart from this, they also hunt wild chickens and small animals. Their hunting method is of a different type. They put some grains and food items under a heavy stone by putting a strong wooden trap. Chickens and small animals come in greed to get them and these people hunt them very easily. They also hunt fish sometimes. In the present times, their food culture is constantly changing. As external contact is increasing, the use of roti, dal and vegetables is also becoming popular in place of fruits and tubers. They have also started growing vegetables around the houses. The ancient Raji people used to eat tubers and fruits, hunt and drink cold water and then sleep in caves. They did not have any worries about tomorrow

The main means of livelihood of the Raji people are wood chopping, labour and animal husbandry. Due to government subsidy, they have become indifferent towards work. They have become inactive. They earn their livelihood by doing certain work.

Raji tribe is a tribe residing in eight villages namely Kuta Chaurani (Didihat), Madanpuri (Didihat), Kimkhola (Dharchula), Ganagaon (Dharchula), Chifaltada (Dharchula), Jamtari (Kanaalichhina), Altari (Kanaalichhina) and Khirdari (Champawat) and has its small society. These people are patrilineal, patrilocal and patriarchal families. Their head is the oldest person in the house. All the members of the family collect forest products together. Raji is monogamous. They marry outside their clan. Here the practice of bride price is nominal. This price is approximately 200-250 rupees. The marriage process is very simple. The forest girl is made to sit on a piece of cloth and both are smeared with tilak. After that, both of them feed each other jaggery or sugar candy. The society accepts them as husband and wife. Polygamy is prevalent. Remarriage, kidnapping and widow marriage are not prevalent in their society. Divorce etc. is very difficult in this society. They consider themselves Rajputs and Harijans as untouchables. In ancient times, when a person died in this society, these people together used to cover the dead body with leaves and leave, but in present times, these people cremate the dead body

The religious structure of Raji society is similar to Hinduism. They worship gods and goddesses. Mahadev, Devi, Bhumiya, Ghananath, Malaynath, Mallikarjuna etc. are their gods and goddesses. Apart from these, worship of Kali and Durga is also prevalent. Their place of worship is under the open sky. They build a platform at the base of a tree and name different gods and goddesses by placing stones on it. They also worship Nanda Devi. Animal sacrifice is offered in her worship. During any auspicious work, the Kul Devta is also worshipped

The economy of the Raji tribe is very pathetic. These people mainly live on hunting and collecting wild goods. In ancient times, there was an invisible trade system in this society. These people used to trade the goods obtained from the wild collection and the goods made of wood through this system. They used to leave their goods at a designated place at night, in return for which the local people used to leave clothes and food at the same place. The Raji used to get those goods the next night. This trade system was very surprising and was based on mutual trust. At present, this system has been abandoned. The Raji, leaving behind their shy nature, go to the nearby market and give their goods to certain traders and get food and clothes in return from them. Torn clothes, a few broken utensils and a shortage of food make the real nature of their economy clear. Many reasons are reflected in their economic condition

Raji society exists separately from other societies due to which mutual economic assistance is not possible .1

Raji is currently abandoning its ancient woodcraft art .2

There is a lack of education among the Raji people. Despite many efforts of the government, education is not spreading .3

These people live in mountainous and forest areas due to which there is a lack of cultivable land .4

There is a lack of means of transport due to which they are not able to get the proper benefits of government grants .5

Due to economic deterioration, these people are suffering from malnutrition and diseases, which has put a question mark on their existence. According to the 1981 census, their population was 1087, which decreased to only 494 in 1991. Despite government efforts, their number is constantly decreasing due to lack of food items, lack of medical services, lonely life etc

As a result of the continuous efforts of the government, the roads and means of communication are being developed due to which Raji has started coming in contact with the outside society. These shy and solitary people are coming in contact with the local people. They are being given grants from time to time by the government. Lack of education, malnutrition in children, infectious diseases, allotted infertile agricultural land, lack of suitable housing etc. are their major problems

---

## 6.6 BOKSHA

---

The Bhoksa tribe resides in Uttarakhand and Himachal Pradesh. In Uttarakhand, it is spread from the Bajpur development block of Nainital to the west and the Vikaspur development block of Dehradun district and Sirmaur district of Himachal Pradesh. Their availability from the river

valleys of the Himalayas to the Bhabar and Terai regions has created more or less differences in - their cultural activities. On this basis, they can be divided into three regional distributions

Mountain valley region - The areas having fertile soil deposits as a result of erosion and .1 depositional activities in the river valleys of the Himalayas and surrounded by a forest belt in the lower part come under this. The tributary rivers of Ganga-Yamuna-Asan-Asan-Asan - , Susada, Swang, .Triveni etc. flow in this region

Bhabar region - The region of .2the Ganga and Ramganga rivers which is inhabited by this tribe is calledthe Bhabar region in which black orregularsoil has been deposited by the rivers. This region provides immense facilities to this tribe which is endowed with natural resources and .human facilities

Terai region - The outer belt of the Himalayas which is in .3the form of a plain and consists of long valleys, bushes and swamps is called the Terai region. Due to the availability of water due to heavy rainfall, fertile land and means of transport, this region is completely different from .the mountain valleys and Bhabar

The Bhoksa tribal area is known as Bhoksar. According to the 1991 census, the total population of the Bhoksa tribe residing in Bhoksar is 42,027, 60per cent of which is in the .Udham Singh Nagar district

They have established a unique identity characterized by racial attributes such as shorter and medium stature, broad facial structure, flattened nasal features, and a darker skin tone, among others. Their physical traits also suggest that extensive racial intermingling has occurred. Scholars such as Cook, Risley, and Majumdar have posited that this group shares a connection with the Mongoloid race; however, a meticulous examination of their physical attributes reveals a lack of resemblance to Mongolian characteristics. Steward recognized this group as a hybrid of Mongoloid and non-Aryan ancestries. The determination of the Bhoksa tribe's place of origin and ancestral lineage remains a contentious subject within academic discourse. William Cook elucidated that these individuals perceive themselves as Rajputs, asserting that they emanate from the southern region or Dhara Nagari of Ujjain. Various scholars have acknowledged the amalgamation of numerous other castes associated with Dhara Nagari, whereas Hasan has identified them as descendants of Jagaddeva. Historical narratives suggest that during the Mughal incursions into India, the Rajput women of Chittor sought refuge in the mountains alongside their retainers. The Bhoksa tribe is perceived as arising from the interactions between these retainers and Rajput women. This dynamic may elucidate the predominance of women and the subordination of men within this societal structure, where men customarily partake in meals .outside the domicile

Bhoksa first settled in a place called Vanvasa in the Terai. This place is covered with dense forests. Their villages are usually surrounded by banana, jamun and mulberry trees. Their villages are both small and big. In some villages, only one family lives, while in some villages

people of many families live. Large villages are divided into many Purvas and each Majhra has a chief. He gets a special place in the society. His house is towards the south of the village and that place is considered as Bhumi Shayan Dev. Attached to this are the houses of other families. The houses in the village are arranged in rows. These rows are in the direction from south to north. There are villages with two or more rows

Patriarchal, patrilineal and patrilocal families exist in the Bhoksa tribe. The smallest unit of this society is the family whose head is the eldest person of the family. The head has unlimited authority and rules the family like an autocratic ruler. All the members of the family obey his orders. Whatever income each member of the family earns is handed over to the head, which he spends as per his wish and requirements. Both joint and individual families exist in this society. In an individual family, the husband-wife and their unmarried children live together, whereas in a joint family, apart from the husband-wife and their children, grandparents, uncles-aunts, cousins, etc. live together and food is cooked together for all. In present times, individual families are becoming more prevalent in place of joint families

Despite the male dominance in the Bhoksa family, women have an important place. Bhoksa women are uneducated or less educated but they are neither slaves nor mistresses of men. They have an equal position as men in society. There is a complete absence of a purdah system among them. They have an important contribution to economic production

In Bhoksa society, the number of women is less than that of men. The practice of purchase marriage is prevalent here. The bride price is paid by the groom's side. The girl actively contributes to the economic activities of the family, which is considered a loss for the father after marriage. In return, he receives the bride price as compensation, which is called Malgati. The father of the girl marries his daughter

They prefer to marry only that person who has sufficient land for their livelihood. In this society, the age of the girl for marriage is considered to be 18-20 years and that of the boy is 20 years. They marry within their own caste and different clans. Polygamy is not socially accepted. Divorce is prevalent in this society but it happens with great difficulty. Widow remarriage is prevalent

The tradition of kinship is prevalent in the Bhoksa society. The daughter-in-law observes purdah from her father-in-law and elder brother. She can neither sit on the cot in front of them nor talk to them directly. Whenever she has to talk to them, she uses her mother-in-law or sister-in-law as a medium. The jokes and pranks between brother-in-law and sister-in-law are also prevalent in this society. After the death of the husband, marriage with the brother-in-law is allowed

The reflection of Hindu religious structure is reflected in Bhoksa society. They are polytheists. They worship goddesses like Kali Maa, Durga, Lakshmi, Ram, Krishna etc. They consider Chamunda Devi of Kashipur as all-powerful. Holi, Deepawali, Janmashtami, Dussehra

etc. are their main festivals. Pahadi Brahmin is their religious leader who conducts religious rituals and marriages. They are blind believers. They believe in black magic, exorcism etc. The person who exorcises is called Bhandare. Before taking the patient to the hospital, he is taken to Bhandare. He exorcises him with tantra-mantra and various types of rituals. Animal sacrifice is prevalent here to please the gods and goddesses. They believe that the gods and goddesses will be pleased with animal sacrifice and will give them freedom from all troubles. After offering the sacrifice, they happily consume the meat as prasada. Peepal is considered to be a very sacred and religious tree. They worship this tree as a symbol of power

Panchayat administration is prevalent in Bhoksa society. The head of the Panchayat is Takht. Under him are the Daroga, Munsif and Sipahi. Each has different functions. The most important among them is Takht. He fixes the date of the meeting in case of any dispute and after listening to both the parties, he gives a fair verdict and gives punishment. Munsif investigates the dispute seriously to know its veracity. The Daroga must execute the punishment prescribed by Takht. The Sipahi sends the information of the date fixed by Takht to the village heads. 10-20 villages come under one Panchayat. At present, a Bhoksa council has been established which settles their disputes

Bhoksa initially made their home in densely forested areas. These people lived on forest products - wood, honey, tubers, fruits, wild animals etc. Gradually the forests started getting destroyed. They started facing food problems. Due to fertile land, forest destruction etc, these people were forced to work as farmers and labourers. At present agriculture has become their main source of livelihood. Initially, every Bhoksa had enough agricultural land but their land was occupied by Paharis, Punjabi refugees and the forest department. These people are uneducated and alcoholics due to which they are now working as labourers on the same land which they once owned

Rice, sugarcane, pulses, oilseeds, potatoes etc. are cultivated here. Sugarcane is cultivated for commercial agriculture. They get cash by selling sugarcane produced in the sugar mills of Bajpur and Kashipur. Apart from this, they buy and sell food grains in local markets. Those who do not have their agricultural land work as labourers in other fields and get 50-100 rupees as remuneration. Agricultural work lasts only for a few months, due to which these people remain idle for most of the rainy season. They sometimes also do fishing, but it is not commercial but for their consumption. These people use pulses, roti and vegetables more in their food. Rice and fish are their favourite food. Consumption of liquor, mulga, bidi, cigarette, etc. is a common thing in this society

Men wear a two-meter-long dhoti, Bandi, shirt and turban on the head while women wear a lehenga and choli. This is their traditional clothing culture which is changing in present times. In present times these people have started using pants, shirts, coats, ties, pyjamas etc. Women have started using saris, blouses, salwar kurtas, and dupattas. Women here are fond of ornaments. They wear traditional ornaments like hansali, habel, sajan, pajeb, chhanni, tengni, galband, veerband

khaila, bangle, vachchok etc. Education is spreading slowly in Bhoksa society. Literacy here is about 14 percent. Some Bhoksa have also been educated and started working but due to lack of money, it is very difficult to get an education.

During the British rule, the Bhoksa community was isolated and far away from civilized society. A Patwari was appointed by the British who collected the land revenue. Banjaras and Muslims sold some essential commodities here. Apart from this, they had no contact with outsiders. They had their own original culture. When refugees were settled here in independent India, their area gradually shrunk. After 1967, the government connected them to the outside world through transport, communication means and electricity lines. Changes started in their culture. Their tradition started changing into modernity.

They face problems of land encroachment, drinking water, indebtedness, transport, cleanliness, health, education etc. The government has taken their problems very seriously and many schemes have been launched to solve them but they are not getting proper benefits from them. If the newly created Uttarakhand state focuses on their problems, then shortly the policies of the government will have an impact on their social and economic life.

---

## 6.7 THARUS

---

Tharu tribe, which makes a living on agriculture, resides in the Nainital district of Uttarakhand, Lakhimpur Kheri, Pilibhit, Gonda, Bahraich, Gorakhpur district of Uttar Pradesh, Assam, Bihar and some districts of West Bengal, Nepal country etc., whose population is 1.20 lakh. This is the tribe with the largest territorial expansion and population among the five tribes of Uttarakhand state. This tribe is of the Kirat dynasty, which is divided into many castes and sub-castes and has created its own distinct culture by doing agriculture and animal husbandry.

Physical characteristics like short height, pale complexion, broad face, flat nose etc. have brought them close to the Mongoloid race, due to which some scholars have accepted them as Mongoloid race. Tharus consider themselves to be descendants of Rana Pratap. Troubled by the atrocities of Muslim rulers, some Rajput women hid themselves in the forest areas of the Himalayas with their followers. Later, these followers also attacked Tharus.

Tharu children were born by establishing marital relations. This fact is confirmed by the high status of women in this society. Women do not serve food to men in the kitchen but push their plates out with their feet and eat in the kitchen themselves.

From the viewpoint of social stratification, Tharu society is divided into Rana, Katharia, Dangaria, Jogia, Pachimaha etc. castes. Rana has a special place in Tharu society. They are considered to be the descendants of Rana Pratap. They reside in Khatima, Sitarganj and Lakhimpur Kheri. Katharia wear the sacred thread of wood grass, which is probably why they were called Katharia. They live in the border areas of Nepal in Lakhimpur Kheri, Gorakhpur, Gonda, Bahraich etc. The original place of the Dangaria Tharu caste is the Dang Valley of



Nepal. They must have been named Dangaria based on the name of this valley. They spread from their original place and settled in India as well. At present, they reside in Bahraich, Gonda etc. districts. Jogi Khanais a Tharu who leads a nomadic life. It is estimated that earlier they were in the form of the Jogi caste of Hindus, which later merged with Tharu. They migrate from Nepal to Nainital and Nainital to Nepal from time to time and earn their livelihood through various economic activities. They reside in the Pachimaha Gorakhpur district. They have a special place in Tharu society after Rana Tharu

The effect of the environment and availability of local resources is reflected in the housing culture of Tharu. The walls of their houses are not made of bricks, stones or mud but are prepared with the help of wooden logs and reeds and coated with black clay. The roofs are made with the help of bamboo and straw. The direction of the house is from north to south but the entrance is in the east which is in the last room in the south. The side or the east part of the house is made to keep household items due to which their houses are often far apart. A community of Tharu builds houses from north to south but the door is not in the southern rooms but in the northern rooms due to which this community is called Ulthawa. There are also designated places for worship and cooking in the house which are in the northern rooms. In their culture, the plan for house construction is made keeping in mind their needs and facilities

Tharu society is patriarchal, patrilineal and patrilocal. The practice of extended joint family is prevalent in it. The responsibility of running this extended family smoothly rests on the oldest person of the family who manages it based on his wisdom and experience. He treats all the members of the family equally, due to which an emotional bond is maintained among all the members. The head of the family divides all the family tasks among each member. All the people follow his instructions. Their tasks also change from time to time. He looks at the women of the society with respect but gives the highest respect to the daughter-in-law. He is ready to protect her even at the cost of his life. He considers her his Griha Lakshmi and honour

In Tharu society, the practice of exchange is prevalent in the marriage system, that is, there is a practice of giving your sister and marrying the other person's sister. But this practice is coming to an end with time. In its place, the practice of Teen Tikthi is becoming popular. In this, instead of marrying each other's sister, they marry some other girl in the family. At this time, there is a practice of taking the bride price. The marriage is decided by Majhpatia. Both the parties accept this. In the marriage ceremony, no priest is invited, but they do it themselves. Tharu people are monogamous, but if needed, they give recognition to bigamy. Examples of elopement marriage, brother-in-law marriage, sister-in-law marriage etc. are also reflected. Urari Pratha (divorce) is also prevalent in this society. Usually, women do Urari. On the contrary, if a man does Urari, then he has to pay the punishment prescribed by society

The kinship system of Tharu society is similar to the kinship system of civilized society. Humor and jokes are prevalent in it. On festivals or special occasions, there is humour and jokes between brother-in-law and sister-in-law, brother-in-law and sister-in-law, maternal uncle and

nephew. Apart from this, like in Hindu society, it is forbidden for the daughter-in-law to take the name of her elder brother-in-law, father-in-law, sister-in-law and brother-in-law. There is a sense of respect towards elders.

The religious structure of Tharu society is similar to the religious structure of Hindu society. They are polytheists and their number is about 36. Their favorite deity is Narayan who is considered to have infinite power. They worship him with great devotion. Many gods and goddesses are also worshipped as his power, to please whom pigs and goats are sacrificed. They offer only flowers to Lord Jagannath. Holi, Deepawali, Dussehra, Krishna Janmashtami, Makar Sankranti, Nagpanchami and Bajhar are their main festivals which they celebrate with great enthusiasm. Drinking alcohol is prevalent on the day of Holi. Their festival called Bajhar is very important and takes place in the rainy season. In this, the women of the village cook and eat food under a Peepal tree near the village and perform worship and dance. Witchcraft is prevalent in this society. They believe in it completely. Its expert is called Bharra. There is a Bharra in every village who performs worship and sacrifices. If needed, he also helps in breaking the magic of others. Tharu people perform the cremation, and tenth and thirteenth-day rituals just like Hindus. When these people return after cremating the body, they construct a small bridge symbolically at the crossroads. They believe that the bridge will provide eternal peace to the soul of the deceased. Through this bridge, it will overcome all the difficulties.

There are village panchayats in Tharu society in which there are three officials, Pradhan, Bhalemanas and Chowkidar. The best official is the Pradhan who is hereditary. His work is to settle disputes in consultation with Bhalemanas. Bhalemanas has the same position as the Deputy Pradhan whose position is also hereditary. Chowkidar gives the Panchayat's fixed information to the plaintiff and the defendant. Meetings of village panchayat are called for disputes over property, theft, quarrels, divorce, kidnapping of a girl etc. These people drink liquor in the meeting, argue over the dispute and finally decide the punishment. The punishment can be both economic and physical. At present, a system of election has been made in the village panchayat in which the Pradhan and 10 members are selected through election. The sacred tradition of Tharu Panchayat's discrimination between milk and water has almost come to an end. Abandoning traditional beliefs, people have started taking refuge in the courts.

The clothing culture of Tharu society represents their traditional culture but gradually modernity is also being incorporated into it. Tharu women usually use Ghangharia-Choli and Udhani. Their Ghangharia is densely pleated, dark-coloured and knee-length. The choli is also colourful and open at the back, over which a coat is worn. They artistically decorate their clothes, the combination of which makes their beauty very attractive. Men wear a dhoti, kurta, pyjama, and shirt and put a cap on their heads. This is their traditional clothing but gradually they are abandoning it and wearing pant-shirts, and coats. Women are adopting salwar kurta and other modern clothes.



People of Tharu society are dependent on agriculture. People living near forest areas hunt chital, pigs and other small wild animals in their leisure time. Agricultural land is very fertile but farming is done with traditional agricultural equipment and seeds due to which production is low. Through this, they solve their food problem. Fishing is also another important economic activity. Men, women and children all participate in it. Fishing is done with the help of nets and Chhaparia. Fishing is done in groups of 20-30 in rivers, canals and ponds where there is a possibility of fish. Women eat the fish hunted by themselves. These people do not consume the fish brought by men. These people hunt fish for themselves. They do not sell it. Apart from this, animals like goats, pigs, chickens, cow etc. are reared here. It is clear that economic activities like agriculture, hunting, fishing and animal husbandry are carried out here but due to traditional techniques, prejudices, ancient beliefs and notions, there is no direct monetary benefit from these, rather these people make their living from these activities

Indebtedness, alcoholism, illiteracy, lack of health services etc. are the burning problems of Tharu society which are being solved by government and non-government organizations. The schemes of the social welfare department and integrated tribal development projects are being run to solve the problems of Tharus, however, no solution is visible in the future. Malaria has gripped this society due to which many people die prematurely. At present, their contact with civilized society is constantly increasing due to which the process of development has started in their culture. All their social, economic, religious and political activities and thoughts are changing

---

## 6.8 JAUNSAR ABAR THE BOUNDARIES OR KANSAS

---

Jaunsar Babar, also known as Khasia or Khasa, is a tribe of Uttarakhand state. This tribe resides in Chakrata tehsil of Dehradun district. Due to socio-economic and religious structure, a distinct cultural characteristic is expressed due to which it has special cultural importance

Social strata are present in Jaunsari society. Three strata are visible in these 2. Handicraftsman strata and 3. Kolta strata through social studies. Brahmin and Rajput strata The Rajput strata are the highest strata of this society. They are prosperous from an economic and social point of view. They own the land. Along with this, they are also farmers and lenders. They represent the upper caste. There is no discrimination among them. Matrimonial relations are also established among them. Their population is more due to which they also represent the society.

The strata of handicraftsmen is considered to be of the middle class. People of castes like goldsmiths, blacksmiths, woodworkers, Nath, Bajgi etc. are included in this. There is discrimination of high and low among them. They are living as servants (slaves) of upper castes. Landlessness and lack of money have forced them to live this kind of life

The main reason for this is that they can be called easily whenever required. Bajgis are the musicians who play music during festivals and are found in almost every village. Their condition is very pathetic. They earn their living by working as labourers for the upper castes. Kolta strata

is the lowest strata of this society which includes people of the castes like Mochi, Dom, Chamar etc. They are looked down upon in the society. They are known as untouchables, landless, labourers, slaves etc. The upper castes do not treat them with humanity. At the same time, it is not possible to earn a living by working as a labourer. Therefore, the Koltas have started working as labourers in the nearby cities. Their residences are on the outskirts of the village. Social strata are found in many Koltas. Khandit-Mundit strata, Maat strata and Sanjayat strata are mainly reflected in this. Khandit-Mundit strata include those Koltas who have been related to the upper castes for generations. They remain in the service of the upper castes. In return, their master takes care of their family. The second level is of Maat Kolta who have accepted slavery of upper castes. In fact, due to the ancestors taking a loan and not paying it, they have to work as hostages or slaves for the lender. This continues from generation to generation until the loan is repaid. Sanjayat level is the information or letter carrier level of Koltas. They are related to the entire village. If there is a death, birth or any auspicious occasion of any person in the village, then these people convey the information to the relatives.

Although the complexity of the social level is present in Jaunsari society, however, if synthesis is done from a historical perspective then it is clear that their society must have been organized. Social work must have been divided into three categories and responsibility must have been assigned to each. This reflects the form of a well-organized society but over time this division of work has taken the form of social prestige which is emerging and being reflected in the form of a complex social structure in the present times.

The houses of the Jaunsari people are like those of the Bhotiya people. These people build houses with the help of stone and slate in which they use deodar or local wood. Their houses are usually two-storeyed. Animals and goods are kept in the lower part while they live in the upper part. In present times, Bihari and Nepali labourers have started building permanent houses with the help of bricks and stones. Due to the ban imposed by the forest department and not being able to get wood, these people have abandoned their traditional architecture and accepted modern architecture.

Jaunsari society is patriarchal, patrilineal and patrilocal. It has the practice of joint family whose head or the eldest male of the family takes decisions on important tasks and is the custodian of the property. All brothers have equal rights in ancestral property. All the members of the family follow every suggestion of the head. Family work is divided according to age and gender. Women do hard labour. They work along with men from household to agricultural work. Children work according to their age. As they grow older, their work keeps changing. Men are involved in complex work and agricultural work. Women do not contact anyone other than their in-laws' family.

Jaunsari people consider themselves to be descendants of Pandavas. The embodiment of the story of Draupadi's marriage is visible in this society. Due to this practice, these people are more famous. The principle of fraternal polyandry is prevalent in this society. The elder brother of the

family marries. He can marry one or more than one. His wife or wives are the legal wives of all the younger brothers. No younger brother is allowed to marry separately for himself. If the youngest brother of the elder brother is a child or is born after his marriage, then when he becomes an adult, the elder brother remarries a girl of his age. This can be called polyandry. One woman is the wife of all the brothers. This is recognized in this society. The effect of this polyandry is reflected in this society. The wife binds all the brothers together so that despite difficult geographical conditions, infertile land, low income and hard life, the maintenance of a large family is very easy. Any child in the family is everyone's child so the child receives everyone's love. The joint family becomes stronger

Bride price is prevalent in Jaunsari society. The bride price was given to the girl's father in the form of livestock which is now given in cash. Sometimes it also happens that if the price is not paid to the girl's side or there is an inability to pay the price, then the first child born to the bride is given as bride price

In Jaunsari society, the practice of divorce is much less. Exemption can be given in this society in situations like infertility, indifference towards agricultural work, sexual intercourse with another man in in-laws' house etc. The man sends his wife to her maternal home and does not bring her back. In such a situation, the husband and wife automatically become aware of the exemption. In case of exemption, there is also a practice of giving compensation to the former wife. The compensation is decided in a meeting of relatives. The compensation is given to the woman's new husband or her guardian or parents. Infertility is considered very inauspicious here. A childless woman is looked down upon in this society

In Jaunsari society, mutual harmony exists in every village because every family in the village is related to each other in some way or the other. Same gotra marriage is not prevalent. A woman is called Dhyantni in her maternal home and Rantuni in her in-laws' home. In her maternal home, she can establish sexual relations with another man, whereas in her in-laws' home, sexual relations with anyone other than the husband are prohibited. Humour is prevalent in this society. There is humour between sister-in-law and brother-in-law, whereas it is forbidden between sister-in-law and brother-in-law

The dress of the Jaunsari people keeps changing with the seasons like people of other societies. In winter Jaunsari men wear round joga, safe and woollen shoes and women wear woollen kurta, ghagra, ghats etc. In summer, men wear cotton kurta, jhala, dig and women wear cotton ghagra, kurta, jhaga etc. This is their traditional clothing culture but in the present times, the influence of modern clothing culture is visible. They are abandoning traditional clothes and using modern clothes

The economy of Jaunsari society is primarily dependent on agriculture and animal husbandry. These people cultivate wheat, rice, maize, chaurai, turmeric etc. Agricultural work, ploughing, sowing, weeding, hoeing, harvesting, threshing etc. are done in a traditional way in

which men and women work together. In agricultural work, animal labour is used extensively along with human labour. Food grains are stored on a large scale. Animal husbandry of Jaunsari is for agricultural work and milk. Its commercial nature is not reflected anywhere. Mainly cows, bulls, buffalo, sheep, goats.etc. are reared

Jaunsari society is a religious society. It is polytheistic. There is reverence for gods and goddesses. These people worship Mahashu, Bhima, Bodha, Chalda, Bijar, Awasi, Silguru, Kali, Durga etc. Mahashu is their main deity on whom they have unwavering faith. They believe that it protects them from calamity and provides prosperity in livestock and agriculture. They worship it with great devotion. Women participate along with men in religious activities and ceremonies. On the days of festivals and fairs, women dance together. Just as in the Hindu tradition in the past, untouchables were forbidden to enter the temple, similarly, in this society, Koltas are strictly forbidden to go to their place of worship. Therefore, Koltas separately worship Lord Narsingh. Experts in witchcraft are called Baki. Bissu, Jagra, Haliyat (Diwali) etc. are the main festivals that are celebrated with great enthusiasm

The political system of Jaunsari society is like that of simple societies. Their entire area is divided into 39 Khats. Each Khat has many villages. Khat is a bigger unit than a village. The heads of Khat and villages are different. The Khat head is called Khatsyana and the village head is called Gramsyana. Both places enjoy social prestige. Mutual disputes are settled by Khumdi (caste panchayat). Its head is Syana. He is aware of all matters and makes decisions

Participation of women in their Panchayats is prohibited. The importance of traditional Syana is gradually decreasing. Village assemblies and Panchayat courts have been formed. When the dispute is indecisive or unsatisfactory, these people have started going to the courts

At present, Tharu society is suffering from many problems. Due to the problem of livelihood from traditional work, they are abandoning it. Joint families are disintegrating and turning into nuclear families. Due to hard labour and scarcity of land, women have started to deviate from their conduct. This deviation is increasing due to coming in contact with pilgrims and tourists. Due to forest law, it has become very difficult to obtain wild things, due to which a serious problem has arisen before them. The Uttarakhand government will have to make efforts to solve their problems. If this does not happen then their original culture will remain confined to the pages of books only

---

## 6.9 SUMMARY

---

The tribal communities of Uttarakhand represent a vital part of the state's cultural and social fabric. Nestled in the picturesque Himalayan and Terai regions, tribes such as the Bhotia, Tharu, Boksa, and Jaunsari showcase a diverse blend of traditions, lifestyles, and practices deeply rooted in their natural surroundings. Each tribe contributes uniquely to Uttarakhand's rich heritage while preserving its distinct identity.

The Bhotia tribe, primarily residing in the Kumaon and Garhwal Himalayas, are known for their semi-nomadic lifestyle. Traditionally, traders migrated between the Indian plains and Tibet, exchanging goods such as wool and salt. However, with the closure of the Indo-Tibetan trade routes, they shifted towards farming and wool-based crafts like weaving carpets and shawls. Their cultural practices reflect Tibetan Buddhist influences, and their seasonal migration is a hallmark of their way of life. The Bhatia community is officially recognized as a Scheduled Tribe.

The Tharu tribe is concentrated in the Terai region, bordering Nepal. They are primarily agrarian, cultivating rice and wheat in the fertile plains. The Tharus are known for their distinctive bamboo and mud houses, vibrant folk dances, and colourful attire. They worship nature and forest deities, reflecting their deep connection to the land. Their social structure is unique, with women often playing significant roles in community decisions. The Tharu tribe is recognized as a Scheduled Tribe and is known for its resilience in preserving its traditions.

The Boksa tribe, found mainly in the Terai and lower foothills, relies heavily on agriculture for sustenance. Their lifestyle is relatively simple, centred around farming, fishing, and traditional crafts. The Boksa people have faced social and economic challenges but continue to preserve their cultural heritage through festivals, rituals, and oral traditions. Officially classified as a Scheduled Tribe, they are beneficiaries of government initiatives aimed at improving their socio-economic conditions.

The Jaunsari tribe, inhabiting the Jaunsar-Bawar region of Dehradun and surrounding areas, traces its lineage to characters from the Mahabharata. Their polyandrous marital system, a rarity in modern times, reflects their ancient customs. Predominantly agricultural, they cultivate crops suited to their mountainous terrain. Jaunsari festivals, folk music, and dance forms are vibrant expressions of their cultural identity. The community is recognized as a Scheduled Tribe, with efforts underway to balance tradition with modernization.

---

## 6.10 GLOSSARY

---

- **Bhotia:** A semi-nomadic tribe primarily residing in the Kumaon and Garhwal Himalayas, known for their wool weaving and trade heritage, influenced by Tibetan culture.
- **Tharu:** An agrarian tribe of the Terai region, recognized for their mud-and-bamboo houses, vibrant folk traditions, and strong connection to forest deities.
- **Boka:** An Indigenous tribe found in the Terai plains, reliant on agriculture and traditional crafts, facing socio-economic challenges despite their rich cultural heritage.
- **Jaunsari:** A tribe from the Jaunsar-Bawar region of Dehradun, known for unique practices like polyandry and their cultural association with the Mahabharata.
- **Scheduled Tribe (ST):** A category in India's constitution that provides special recognition and benefits to certain indigenous communities, including Bhotia, Tharu, Boksa, and Jaunsari tribes in Uttarakhand.

- **Indo-Tibetan Trade:** The historical trade route used by tribes like the Bhotia, involving the exchange of goods such as wool, salt, and grains between India and Tibet.
- **Polyandry:** A marital system where one woman marries multiple men, historically practised by the Jaunsari tribe in Uttarakhand.
- **Terai Region:** A low-lying, fertile area in Uttarakhand where tribes like the Tharu and Boksas are concentrated, known for their rich biodiversity and agricultural productivity.
- **Wool Weaving:** A traditional craft of the Bhotia tribe, producing items like carpets and shawls, integral to their livelihood and cultural identity.
- **Forest Deities:** Nature spirits or gods worshipped by tribal communities like the Tharu, reflecting their spiritual connection to forests and the natural world.

---

## 6.11 ANSWER TO CHECK YOUR PROGRESS

---

**1. The Bhotia tribe is primarily associated with which region of Uttarakhand?**

- A. Terai
- B. Kumaon and Garhwal Himalayas
- C. Dehradun Valley
- D. Doon Valley

**Answer: B.**

**2. The Tharu tribe is primarily found in which region?**

- A. High-altitude villages
- B. Forests of the Terai region
- C. Central Himalayan ranges
- D. Doon Valley

**Answer: B.**

**3. What is a prominent livelihood activity of the Boksas tribe?**

- A. Agriculture
- B. Animal husbandry
- C. Wool weaving
- D. Hunting and gathering

**Answer: A.**

**4. The Jaunsari tribe traces its origins to which ancient epic?**

- A. Mahabharata
- B. Ramayana
- C. Puranas
- D. Buddhist Jataka tales

**Answer: A.**

**5. Which of the following is a significant cultural practice among the Tharu tribe?**

- A. Performing wool weaving
- B. Worshiping forest deities
- C. Celebrating the Harela festival
- D. Practicing polyandry

**Answer: B.**

**6. The Bhotia tribe is known for which traditional craft?**

- A. Bamboo weaving
- B. Wool spinning and weaving
- C. Pottery
- D. Jewelry Making

**Answer: B.**

**7. Which tribe is recognized for their unique polyandry practice?**

- A. Tharu
- B. Jaunsari
- C. Boka
- D. Bhatia

**Answer: B.**



**8. The Boksas tribe is officially classified under which category in India?**

- A. Scheduled Caste
- B. Scheduled Tribe
- C. Other Backward Class
- D. General Category

**Answer: B.**

**9. The Tharu tribe's traditional houses are made of which material?**

- A. Bamboo and mud
- B. Bricks and cement
- C. Stone and wood
- D. Sandstone

**Answer: A.**

**10. Which tribe practices seasonal migration and trade as part of their traditional lifestyle?**

- A. Tharu
- B. Boka
- C. Bhatia
- D. Jaunsari

**Answer: C.**

---

## 6.12 REFERENCES

---

- Bisht, B. (2006). Tribes of Uttaranchal: A study of education, health, hygiene and nutrition, Kalpaz Publication, Delhi. pp. 102.
- Hasan, A. (1979). The Buxas of the Tarai. B.R. Publishing Corporation. pp. 23.
- Uttarakhand Tourism Development Board  
URL: <https://uttarakhandtourism.gov.in/activity/tribals/>
- Singh, K.S. (1994). People of India Vol.III – The scheduled tribes, Oxford University Press, New Delhi. pp.121.
- Naswa, S. (2001). Tribes of Uttar Pradesh and Uttaranchal, Mittal Publication, New Delhi. pp.19.



- Atkinson, E.T. (1982). *Himalayan gazetter Vol.II Part I* Cosmo Publications. pp. 371.
- Kumar, N. (2013). *The Bhotias of Uttarakhand: Cultural Continuity and Change*. New Delhi: Indira Gandhi National Centre for the Arts.
- Sati, V.P. (2017). *Traditional Knowledge and Socio-Economic Condition of Indigenous People in the Uttarakhand Himalaya, India*. Springer.
- Negi, C.S. (2012). *Cultural and Religious Practices of the Bhatia Community in Uttarakhand: An Overview*. *Journal of the Anthropological Survey of India*.
- Rawat, V. (2008). *Languages and Dialects of Uttarakhand*. Dehradun: Government of Uttarakhand.
- Negi, M.S. (2009). *Folk Traditions of Jaunsar-Bawar in Uttarakhand*. *Indian Journal of Folklore Studies*.
- REKHA SINGH, *Socio-cultural Study on Tribal Communities of Uttarakhand*, *International Journal of Applied Social Science* Volume 6 (6), June (2019): 1688-1690 Received: 28.04.2019; Revised: 12.05.2019; Accepted: 28.05.2019
- Maithani D. D., Prasad G, Rajesh Nautiyal: *Geography of Uttarakhand*, Sharda Pustak Bhawan Publication, Allahabad

---

### 6.13 TERMINAL QUESTIONS

---

1. Discuss the socio-economic and cultural practices of the Bhotia tribe. How have these practices evolved due to external influences?
2. Examine the role of nature in shaping the cultural and religious beliefs of the Tharu tribe. Provide examples from their festivals, rituals, or daily life.
3. What are the main challenges faced by the Boka tribe in terms of social and economic development? Suggest possible measures to address these issues.
4. Describe the unique traditions and lifestyle of the Jaunsari tribe, highlighting the historical significance of their polyandrous marital system.
5. How have government policies and tribal recognition (Scheduled Tribe status) impacted the lives of Uttarakhand's tribal communities? Provide specific examples.
6. Analyze the importance of traditional crafts, such as wool weaving among the Bhotia tribe, in preserving their cultural identity and supporting their economy.
7. What role does agriculture play in the lives of the Tharu and Boksa tribes? Compare their farming methods and the challenges they face in a changing environment.
8. Discuss the impact of modernization and migration on the traditional lifestyles of Uttarakhand's tribal communities. How are they balancing tradition and modernity?
9. Explore the connection between the geographical location of each tribal community (e.g., Himalayas, Terai, and foothills) and their distinct cultural practices and livelihoods.

10. What steps can be taken to ensure the sustainable development and cultural preservation of the tribal communities of Uttarakhand? Highlight the role of education, tourism, and local governance.

**UNIT- 7 GENDER DYNAMICS AND SOCIAL ISSUES,  
EDUCATION, HEALTHCARE, AND SOCIAL WELFARE  
INITIATIVE**

---

***7.1 OBJECTIVES***

***7.2 INTRODUCTION***

***7.3 GENDER DYNAMICS AND SOCIAL ISSUES, EDUCATION,  
HEALTHCARE, AND SOCIAL WELFARE INITIATIVE IN UTTARAKHAND***

***7.4 SUMMARY***

***7.5 GLOSSARY***

***7.6 ANSWER TO CHECK YOUR PROGRESS***

***7.7 REFERENCES***

***7.8 TERMINAL QUESTIONS***

---

## **7.1 OBJECTIVES**

---

After reading this unit you will be able:

- Understanding the gender inequality in education in Uttarakhand.
- Gain knowledge about the major social issue of Uttarakhand as Education, Healthcare and Social welfare schemes.
- Understanding analyse the impacts of various government schemes to tackle gender inequality in education, health care and social welfare in Uttarakhand.

---

## **7.2 INTRODUCTION**

---

Gender dynamics is a complex and diverse topic, which affects every aspect of human life as a fundamental social construct. It shapes identities, roles and interactions within societies. The complex interplay between gender dynamics, social norms, power structures and cultural influences has given rise to a diverse landscape of gender realities. The study of gender dynamics helps in understanding gender discrimination, distribution of powers and social structures in a society and how these affect various aspects of the lives of women and men in a society. Uttarakhand, one of the fastest growing hill states of the country in North India is renowned for its natural beauty and cultural diversity. Gender dynamics in Uttarakhand have long been deeply ingrained in the cultural, social and economic fabric of the society. The state's historical roots, traditional values and evolving modernity have shaped complex gender roles, resulting in a landscape where gender inequality persists despite substantial progress in various fields. These dynamics manifest in multi-dimensional ways, affecting the lives of women and non-binary individuals at all levels of society. Traditional gender roles in the state have historically set specific duties, expectations, and limitations based on gender. These roles often confined women to domestic responsibilities, while men were primarily associated with bread-winning and decision-making roles. While these traditional norms persist to varying extents, the state has also witnessed significant changes in gender dynamics, with more women entering the workforce, challenging social norms and seeking greater agency in decision-making processes. It is important to study the state of gender dynamics in Uttarakhand due to their widespread impact on the state's social and economic development as gender inequality perpetuates the cycle of

poverty, limits educational and economic opportunities, hinders the realization of human rights. Gender dynamics have a wide-reaching impact on sustainable development. It is also the basis of economic costs, which can also hinder human development indicators. Hence, to understand gender dynamics in Uttarakhand it is necessary to analyse various aspects like education, healthcare, and social welfare etc.

---

### 7.3 GENDER DYNAMICS AND SOCIAL ISSUES, EDUCATION, HEALTHCARE, AND SOCIAL WELFARES IN UTTARAKHAND

---

The demographic profile of Uttarakhand is an important indicator of the social and economic status of a state. It includes the population of the state, their age, sex ratio, caste, religion, education level, employment, and other socio-economic characteristics. According to the 2011 census, the total population of the state was around 1.01 crore (10.1 million). This population figure will increase slightly after 2021. And the sex ratio was 963 women per 1000 men according to the 2011 census. However, this ratio is slightly higher than the country's average sex ratio (940), but it needs improvement over time. The population in the age group of 0-14 years is around 30%, while the population of working age (15-59 years) is around 60%. The percentage of the age group of 60 years and above is relatively low, which is a positive sign that the state has a good number of workforces. The Scheduled Caste population of the state is around 18.8% and the Scheduled Tribe population is around 2.89%. The literacy rate in the state was 79.63% in 2011, with the literacy rate for males being 87.40% and for females being 70.01%. Gender mobility in Uttarakhand is a complex and multi-dimensional issue, influenced by social, economic, cultural and political factors. Some of the key aspects are discussed here:

**Table No.7.1**

<b>Demographic Profile</b>	
Total Population	1,00,86292
Total Male Population	51377773
Total Female Population	4948519
Sex Ratio	963
Decadal Growth Rate	18.8%

Population Density	189
Total Scheduled Castes Population	1892516
Total Population of Scheduled Tribes	291903
Total Rural Population	70,36,954
Total Urban Population	30,49,338
Literacy Rate	78.82%
Male Literacy Rate	87.40%
Female Literacy Rate	70.01%

Source-census of India 2011

**Table No. 7.2: Sex ratio in Uttarakhand (female /1000), 1901 -2011**

Year	Uttarakhand Hills	Uttarakhand Plains	Uttarakhand	India
1901	973	812	918	972
1911	973	770	907	964
1921	998	742	916	955
1931	991	749	913	950
1941	991	728	907	945
1951	1038	754	940	946
1961	1064	757	947	941
1971	1050	784	940	930
1981	1022	822	936	934
1991	1009	850	937	926
2001	1037	884	962	933
2011	1037	900	963	943

Source-census of India 2011

The analysis of the data in Table No. 7.2 makes it evident that, in both regions of Uttarakhand, the sex ratio of hilly and plain areas is lower in the early decades (1901 to 1941) than it is in the subsequent decades (2001 to 2011). In the plain areas, the number of women declined between 1901 and 1971, whereas in the hilly areas, the number of women rose every decade in the following decades. Up until 1951, the average sex ratio in Uttarakhand was lower

than the national average. The average sex ratio of women in the state's hilly regions has improved after independence (1951–2011). However, despite some progress, there are still just 900 women in per 1000 males the state's plains. One of the main reasons for this is the migration of men from the hilly areas to the plains and other outer areas.

### **7.3.1 Education status in Uttrakhand**

Literacy is an important indicator of social, economic and cultural progress. The level of literacy in a region is related to various aspects of life including health, knowledge awareness, and political participation. Recognizing the importance of literacy, the United Nations Development Programme has included it in its literacy index. Education not only contributes to the upliftment of mankind and better human resource management, but it also improves the quality of life at home and in society. An educated person is able to promote the education of his children, especially the girl child, as well as reduce infant mortality and population growth. The reality of our traditional conservative culture is that children are sent to school or higher education on the basis of their gender, instead of developing them as assets for the modern society who can hone the skills to deal with the difficulties of their day. The gender bias that exists in our society has both economic and social reasons. Parents also do not see the purpose in training a girl child who will get married in the near future and settle down as a housewife. Other issues affecting education include lack of funds, inadequate health facilities and motivation, sexual exploitation, unrealistic expectations and conflicting social roles. Education helps a person to create awareness about his/her legal, social, political and economic rights, provisions and privileges so that they can fight against all forms of social discrimination. It enables them to recognize their abilities, develop skills, get employment and improve their nutritional and health status.

Education helps women to lighten the burden of tradition of ignorance and strict seclusion within the home, equip them with the expertise and knowledge required to play a modern role, broaden their horizons and raise their general status in society. Therefore, educating women not only promotes their political participation and economic independence but also improves the quality of life of them and the entire family and then the entire nation in a broader sense.

Table No. 7.3: Literacy rate pattern (%) in Uttarakhand, 1951-2011

Year	Literacy		
	Person	Man	Woman
1951	18.93	32.15	4.78
1961	18.5	28.17	7.33
1971	33.26	46.95	18.61
1981	46.06	62.35	25.00
1991	57.75	72.79	41.63
2001	72.28	84.01	60.22
2011	78.82	87.40	70.01

Source-census of India 2011

Table No. 7.4: District wise literacy rate in Uttarakhand (%)

District	Literacy rate			Difference in Female to Male literacy rate
	Person	Man	Woman	
Uttarkashi	75.8	88.8	62.4	26.4
Chamoli	82.7	93.4	72.3	21.1
Rudraprayag	81.3	93.9	70.4	23.5
Tehri	76.4	89.8	64.3	25.5
Dehradun	84.2	89.4	78.5	10.9
Pauri	82.0	92.7	72.6	20.1
Pithoragarh	82.2	92.7	72.3	20.5
Bageshwar	80.0	32.3	69.0	23.3
Almora	80.5	92.9	69.9	22.9
Champawat	79.8	91.6	68.0	23.6
Nainital	83.9	90.1	77.3	12.8
Udham Singh Nagar	73.1	81.1	64.4	16.6
Haridwar	73.4	81.0	64.8	16.3
Uttarakhand	78.8	87.4	70.0	17.4



<b>India</b>	73.6	80.9	64.6	16.3
--------------	------	------	------	------

Source-census of India 2011

### 7.3.2 Healthcare status in Uttarakhand

According to recent National Health Survey data, the number of sub-health centers, primary health centers and community health centers in Uttarakhand has increased as compared to 2005. The state has 21.39% excess sub-health centers and 2.39% primary health centers and a shortage of 9.68% community health centers. Currently, there are 1,839 sub-health centers, 257 primary health centers and 56 community health centers in rural areas, while the required number is 1,515 sub-health centers, 251 primary health centers and 62 community health centers. In urban areas, there are 38 primary health centers against the required number of 78, a shortage of 51.28%. The state has 13 district hospitals, 19 sub-district hospitals and 4 government medical colleges. Tribal areas have 146 SC, 7 PHCs and 5 CHCs, while the required number of sub-health centers is 92, number of primary health centers is 13 and number of community health centers is 3. Tribal areas have a 46.15% shortfall in the number of health centers compared to the required number of primary health centers. Health care in Uttarakhand has progressed over the last few decades but rural areas still lack adequate health services and infrastructure, there is a shortage of qualified medical staff, especially in hilly and remote areas and people have to travel long distances to access basic medical services. Maternal and infant mortality rates are high in rural Uttarakhand, partly due to inadequate maternal care, poor nutrition and lack of awareness about family planning and health care. With the increasing challenges of unemployment, poverty, migration and natural disasters, the health care system needs further improvement.

### 7.3.3 Social welfares in Uttarakhand

Social welfare is the process by which social justice and equity are promoted in society so that everyone's basic needs are met and they can live a dignified life. It includes government-run programs and initiatives such as healthcare, education, pension schemes, and other social security programs, as well as poverty reduction initiatives. It includes initiatives to provide assistance, education, healthcare, employment, and security to the elderly, disabled, women, and other socially vulnerable groups. The major social welfare schemes run by the Uttarakhand government are mentioned below.

### 7.3.3.1 Child Welfare Schemes in Uttarakhand

**1. Mukhyamantri Bal Sashaktikaran Yojana:** - It is an important scheme designed for the all-round development of children in the state of Uttarakhand. The objective of this scheme is to provide education, health, mental empowerment, and awareness of their rights to the children. Through this, the state government is taking many initiatives for the welfare of children so that they can get better opportunities and achieve success in their lives. Under this, free education, scholarships and books are provided to the children, medical health services for children, vaccination campaigns, and nutritional support are provided to prevent malnutrition, various workshops, sports competitions, and camps are organized to increase the confidence of children, awareness programs are organized to protect children from child labor, child marriage and physical and mental abuse.

**2. Balika Samman Yojana:** Balika Samman Yojana: Balika Samman Yojana in Uttarakhand is an important initiative for the welfare of girl children. Its aim is not only to encourage the birth of a girl child but also to create a positive environment for their education, health and overall development. Through this scheme, the government has taken an important step towards changing the thinking towards daughters in the society and empowering them. The objective of this scheme is to improve the sex ratio in the state and encourage the birth of daughters, provide education, nutrition and security benefits to girl children, financial assistance is provided at every stage from the birth of the girl child to her education. So that they can become self-reliant and empowered. This scheme is an important step towards increasing the importance of daughters in the society and ensuring equal opportunities for them.

### 6.3.3.2 Women Welfare Schemes in Uttarakhand

**1. Destitute Widow (Pension) Maintenance Grant:-** Under this scheme, there is a provision of giving pension grant of Rs. 1500/- per month for the maintenance and education of children of widows whose age is between 18 years to 60 years and whose monthly income is not more than Rs. 4000/- and whose son/grandson is not more than 20 years.

**2. Reward Scheme for Couple on Marriage with a Widow:-** Under this scheme, there is a provision of giving an amount of Rs. 11000/- as a reward to the couple on remarriage with a widow below the age of 35 years.

**3. Maintenance grant to deserted married women, destitute women, wives of mentally deranged persons and destitute unmarried women:-** Under this scheme, deserted women whose age is more than 35 years or less than 60 years but at least 07 years have passed since the husband abandoned them after marriage or whose husband is missing for 07 years, will be given Rs. 1200 per month and mentally deranged women whose age is more than 18 years and less than 60 years or the woman's husband is mentally deranged, will be given Rs. 1400 per month and unmarried women whose age is more than 40 years and less than 60 years, are dependent on parents, come under BPL category or do not have an annual income of more than Rs. 48000/- will be given a pension grant of Rs. 1200.00.

**4. Scholarship Scheme for Women/Girls of General Caste:-** Under this scheme, there is provision to give scholarship to women/girls of families living below poverty line for pursuing higher education in Medical, Engineering, Polytechnic and ITI, MBA.

**5. Legal Aid to Women Suffering from Dowry: -** Under this scheme, there is provision to give Rs. 400/- per month as financial grant to women harassed due to dowry who have lodged First Information Report in the police station or whose case is pending in the court and whose monthly income is less than Rs. 1000/- till the case is settled.

**6. Financial assistance to women suffering from dowry:** Under this scheme, there is a provision to give a one-time grant of Rs. 1000/- to women whose monthly income is less than Rs. 1000/- and women harassed due to dowry who have lodged a First Information Report (FIR) in the police station or whose case is pending in the court, for pleading the legal case.

### **7.3.3.3 Scheduled Tribe Welfare Schemes in Uttrakhand**

**1. Brief description of Scheduled Tribes:** Bhotia, Tharu, Jaunsari, Buksa and Raji residing in Uttrakhand were declared Scheduled Tribes in the year 1967. Out of the above five tribes, Buksa and Raji tribes are economically, educationally and socially poorer and backward than other tribes, hence they have been placed in the category of primitive tribal group. As per the

commitments of the state government, the welfare of scheduled tribes and improvement in their standard of living has been given high priority; many schemes are being run for the economic, social and educational upliftment of the people of these classes so that their all-round development can take place. The main objective of various welfare schemes for this class is to connect scheduled tribes with the main stream of society by supporting them at educational, social and economic level.

**1. Scholarship Scheme:** Pre-tenth classes (Class 1 to 8) and ITI Scholarship- Uttarakhand Government is running scholarship schemes with the objective of making the Scheduled Tribe students literate and educated. To motivate them towards education and to provide financial assistance for education, the department provides them scholarships from primary to postgraduate level. A. Rs. 50/- per month per student to students of class 1 to 5, Rs. 80/- per month to students of class 6 to 8. Scholarships are being provided to all the tribal students of class 1 to 8 studying in the schools of the state. Income of parents/guardians is not fixed. B- Scholarship for Class 9 and 10: - There is a provision by the Ministry of Tribal Affairs, Government of India, New Delhi for tribal students of class 9 and 10 whose family's annual income does not exceed Rs. 2.5 lakhs, scholarship for hostellers at the rate of Rs. 525.00 per month for 10 months and book and non-recurring assistance of Rs. 1000.00 per year and scholarship for day hostellers at the rate of Rs. 225.00 per month for a total of 10 months and book and non-recurring assistance of Rs. 750.00 per year.

**B. Scholarship in post-metric classes:** Scholarship is provided to all those students of scheduled tribes in Uttarakhand state whose parents/guardians' annual income from all sources is not more than Rs. 2.50 lakh (Rupees two lakh fifty thousand only). This scholarship is provided under the rules prescribed by the Government of India. Scholarship is also provided to those students of the state who are pursuing higher education in various colleges outside the state.

**2. Running of Government Ashram System Schools:** For the educational upliftment and development of boys/girls of scheduled tribes residing in Uttarakhand state, the department is currently running 16 Government Ashram System Schools, out of which 4 are up to high school level and 1 junior high school for girls. Similarly, 8 schools up to high school level, 1 junior high school level and 2 primary level schools are being run for boys. After the formation of Uttarakhand state, approval was given for the construction of buildings of the schools which were

running on rent and the old buildings were renovated. In the Government Ashram system schools, facilities like free food, clothing, accommodation, stationery and medicine etc. are provided from the primary to the final class.

**3. Operation of Eklavya Adarsh Residential School:** For the talented students of Scheduled Tribes, three Eklavya Adarsh Residential Schools are already operating in the state, namely, Kalsi, Dehradun district, Bajpur and Khatima district Udham Singh Nagar. In the year 2021-22, approval for operating a new Eklavya Adarsh Residential School in village Meharwana of Chakrata development block of Dehradun has been given by the Ministry of Tribal Affairs, Government of India, New Delhi. There is a provision for providing education from class 6 to 12 in the said schools.

**4. Welfare programmes for primitive tribes (Buksha and Raji):** In the year 1967, the Government of India has declared 5 tribes namely Tharu, Buksha, Bhotia, Raji and Jaunsari as scheduled tribes. Out of the five tribes, Buksha and Raji tribes are much backward and poorer than other tribes and hence they have been placed in the primitive group. Buksha tribe is mainly residing in Vikasnagar Sahaspur, Vikasnagar, Doiwala of Dehradun district, Duggada block of Pauri Garhwal district, Bahadarabad block of Haridwar district, (Laldhang area), Bajpur, Gadarpur, Kashipur of Udham Singh Nagar district, Ramnagar block of Nainital district, Raji tribe resides mainly in Dharchula, Kanalichhina, Didihat of Pithoragarh district and Champawat block of Champawat district. For the development of the above mentioned two tribes, a scheme of 100% grant has been implemented by the Government of India, in which the amount of central share is approved by the Government of India on the basis of the recommendation of the State Government.

**5. Tribal Sub-Plan for Tribes:** Under the Tribal Sub-Plan for Scheduled Tribes, 100% central assistance is provided by the Government of India. Under this scheme, proposals are prepared for the social, economic and educational development of the people of Scheduled Tribes and are made available to the Ministry of Tribal Affairs, Government of India. The Ministry of Tribal Affairs, Government of India approves the proposals and allocates the amount to the State Government.

**6.Training of participants by Pre-competitive exam coaching centers:** Under the said scheme, private coaching centers are selected in the state for free arrangement of pre-exam coaching for the preparation of various competitive examinations through various government and non-government organizations and private institutions to increase the employment opportunities of the students of Scheduled Tribes. There is a provision to provide scholarship of Rs. 750.00 per month (local) and Rs. 1500.00 per month (external) to the youth/girls of scheduled tribe receiving coaching through selected coaching centers.

**7. Grant scheme for marriage of daughters of scheduled tribe:** Like scheduled caste, families of scheduled tribe living below poverty line, whose income limit is Rs. 48,000/- (Rs. forty eight thousand only) per annum or belong to BPL family, will be provided a lump sum amount of Rs. 50,000/- (Rs. fifty thousand only) as financial assistance for marriage of maximum two daughters. Maximum two daughters of widows of general category BPL family will also be provided a lump sum amount of Rs. 50,000/- (Rs. fifty thousand only) as financial assistance for their marriage. Provision has been made to grant approval of funds to the applicants as per the following priority.

### **7.3.4. Major Healthcare Welfare Schemes in Uttrakhand**

Several major social welfare schemes are being run to promote healthcare in Uttrakhand. The objective of these schemes is to provide better healthcare facilities to the citizens of the state, reduce the burden of disease, create an enabling environment, ensure nutrition, water, sanitation, treatment of people below poverty line in the state and make health services accessible to every individual. The aim is to reach replacement level of fertility, population stability with proper focus on deprived sections, inaccessible and remote areas. To improve the access and quality of health care services, strengthen health infrastructure and promote public private partnership.

**7.3.4.1. Chief Minister Health Insurance Scheme:** The objective of the Chief Minister Health Insurance Scheme is to provide high quality medical services to the poor and weaker sections of the state. Under this, the state government provides health insurance cover (accident, surgery and treatment of serious diseases) to those people who are below the poverty line (BPL) or in weak

economic condition. Under this scheme, the maximum amount is covered for treatment when admitted in government and private hospitals, giving them relief from heavy medical expenses.

#### **7.3.4.2. Ayushman Bharat Yojana:**

Ayushman Bharat Yojana, also known as Pradhan Mantri Jan Arogya Yojana, is a national health insurance scheme for the poor and vulnerable sections. The main objective of this scheme is to make high quality health services available to every poor citizen. This scheme has been effectively implemented in Uttarakhand, and under this, free treatment up to Rs 5 lakh is provided to eligible families.

**7.3.4.3. Uttarakhand Mukhyamantri Swasthya Seva Yojana:** Uttarakhand Mukhyamantri Swasthya Seva Yojana is an important step to provide treatment to the poor and weaker sections of the state for serious diseases. This scheme has been created by the state government to ensure equality and justice in health services, so that no person is deprived of treatment only due to his financial condition. This scheme covers diseases requiring serious and expensive treatment such as cancer, kidney diseases, heart problems, diseases related to brain and nervous system, organ transplant related diseases, diabetes and other serious diseases.

**7.3.4.4. Uttarakhand Health and Family Welfare Mission:** "Uttarakhand Health and Family Welfare Mission" is an important initiative for the improvement of health services and family welfare in the state of Uttarakhand. The main objective of this mission is to provide better facilities in the field of health to the citizens of the state and to increase health awareness in the society (to make people aware about healthy lifestyle, nutrition, cleanliness and disease prevention). Under this mission, the state government is going to comprehensively improve health services and provide awareness and help on topics like family planning, pregnancy, child care, vaccination, etc.

**7.3.4.5 Maternity Security Scheme:** Maternity Security Scheme of Uttarakhand State is an important state-level health scheme, which aims to ensure the health security of pregnant women and children of poor and economically weaker sections residing in rural and urban areas of the state. Under this scheme, the state government provides health care services to pregnant women so that they can get safe delivery, treatment and other health benefits. Under this, regular pregnancy checkups, blood tests, ultrasound, and other health services are provided to women for



free. And health services are also provided to women after delivery, including vaccination of the baby, care of the newborn, and information about proper nutrition to mothers. Under this scheme, the government provides financial assistance to pregnant women during delivery, so that they can get treatment without any kind of financial hindrance.

---

#### **7.4 SUMMARY**

---

Gender dynamics in Uttarakhand, like other states in India, are influenced by a combination of cultural traditions, social norms, economic conditions and political factors. There has been significant progress in education, employment and political participation for women. Patriarchy is still deeply ingrained in Uttarakhand society, leading to deep-rooted gender inequalities and challenges. Rural areas in particular still face significant barriers, but women's increased participation in community decision-making, empowerment through education and entrepreneurship, and access to health and wellness services are all steps towards creating a more gender-equal society. The younger generation is beginning to challenge traditional gender roles. With urbanization, education and greater exposure to the media, many women and men are rethinking old norms. Women's participation in politics, education and the workforce is gradually increasing, and this change is helping to challenge traditional notions of femininity and masculinity. As the region develops socially and economically, the challenge will be to strike a balance between modernity and tradition while ensuring those women's voices and rights are at the center of development policies. There are many initiatives by the government and NGOs aimed at empowering women in Uttarakhand. These include improving girls' education, providing microfinance for women's self-help groups (SHGs), skill development programs, and schemes focused on promoting women's participation in decision-making processes. For example, the state's self-help groups have empowered rural women by providing them with financial independence and improving their entrepreneurial skills.

---

#### **7.5 GLOSSARY**

---

**BPL Family:** BPL Family is an economic standard set by the Government of India, which aims to identify people and families who are living in poverty and who are most in need of financial help.



**Demographic Profile:** Demographic Profile means details of the major demographic characteristics of a particular group, community or population like date of birth, age, sex, caste, education, professional status, family status, income, religion, etc. of an individual, group, district or state.

**SHGs:** Self Help Group (SHG) is an organization working as a small group in which members solve their problems with the help of each other. This group usually consists of 10 to 20 individuals who have similar social and economic conditions. The purpose of these groups is not only financial assistance but also social empowerment, education, health, and improvement of various life skills.

**Gender Dynamics:** Gender Dynamics is the study of the changes and effects of the relationships, roles, and power between the sexes (men, women, other genders) in society and how expected behaviors, rights, and responsibilities based on gender change in society and how this affects different areas of society (e.g., workplace, family, education).

**Scheduled Tribes:** Scheduled Tribes are communities that have special rights and protection under the Indian Constitution. They usually reside in tribal areas, such as hilly areas, forests and remote rural areas. These communities are socially and economically backward and their culture, lifestyle, and traditions are different from other societies. Scheduled tribes are given priority in reservation, education, employment and other social welfare measures in government schemes, so that their social and economic condition can be improved.

---

## 7.6 ANSWER TO CHECK YOUR PROGRESS

---

**1. Which scheme was launched to increase the level of education in Uttarakhand?**

- (A) National Education Policy
- (B) Sarva Shiksha Abhiyan
- (C) Digital Education Scheme
- (D) State Education Policy

Answer: (B)

**2. Which major work has been done to improve the quality of education in Uttrakhand?**

- (A) Starting online education
- (B) Modernization of schools
- (C) Free study material distribution
- (D) All of the above

Answer: (D) All of the above

**3. Which scheme has been implemented in Uttrakhand to make women economically empowered?**

- (A) Jan Dhan Yojana
- (B) Pradhan Mantri Awas Yojana
- (C) Chief Minister Women Self Help Group
- (D) Ujjwala Yojana

Answer: (C)

**4. Which scheme has been started to promote education for girls in Uttrakhand?**

- (A) Kanya Dhan Yojana
- (B) Chief Minister Kanya Shiksha Yojana
- (C) Beti Bachao Beti Padhao
- (D) Women Empowerment Scheme

Answer: (B)

**5. Which is the main challenge in the healthcare system in Uttrakhand, especially in rural areas?**

- (a) Lack of medical equipment

- (b) Lack of qualified doctors
- (c) Lack of access to healthcare facilities due to geographical barriers
- (d) Overcrowding in urban health centers
- (e) All of the above

Answer: (e)

**6. Under which scheme, health services have been spread in the state of Uttarakhand?**

- (A) Janani Suraksha Yojana
- (B) Ayushman Bharat
- (C) National Health Mission
- (D) All of the above

Answer: D) All of the above

**7. Which of the following is the main objective of the Social Welfare Department in Uttarakhand?**

- (a) Encouraging private businesses
- (b) Promoting environmental sustainability
- (c) Providing financial assistance to marginalized groups
- (d) Limiting migration to urban areas

Answer: (c)

**8. For what purpose is 'Health Fair' organized in Uttarakhand?**

- (A) To impart health education
- (B) Vaccination drive

- (C) Free medical checkup
- (D) All of the above

Answer: (D) All of the above

**9. Which scheme has been organized for the disabled in Uttrakhand?**

- (A) National Disability Policy
- (B) Divyang Jan Empowerment Scheme
- (C) Divyang Rehabilitation Scheme
- (D) All of the above

Answer: (D) All of the above

**10. Which scheme has been started for the elderly in the state of Uttrakhand?**

- (A) Old Age Pension Scheme
- (B) Old Age Empowerment Scheme
- (C) Old Age Welfare Scheme
- (D) All of the above

Answer: (A) Old Age Pension Scheme

**11. Which scheme has been launched to empower women in the state of Uttrakhand?**

- (A) Maternity Vaad
- (B) Women Welfare Scheme
- (C) Mahila Shakti Yojana
- (D) Women Harassment Scheme

Answer: (C)

## 7.7 REFERENCES

---

file:///C:/Users/user/Downloads/s44202-022-00054-2.pdf.

<https://academic.oup.com/tbm/article/14/1/13/7130278?login=false>.

<https://motherhooduniversity.edu.in/pdf/Publications/2016/2..Research%20Paper.pdf>.

[https://nhsrcindia.org/sites/default/files/practice\\_image/HealthDossier2021/Uttarakhand.pdf](https://nhsrcindia.org/sites/default/files/practice_image/HealthDossier2021/Uttarakhand.pdf).

<https://onlinelibrary.wiley.com/doi/full/10.1111/1467-9566.13008>.

<https://socialwelfare.uk.gov.in/pages/display/104-scheduled-tribes-welfare>.

<https://www.adb.org/sites/default/files/linked-documents/38272-044-sd-05.pdf>.

<https://www.motherhooduniversity.edu.in/pdf/Publications/2016/2..Research%20Paper.pdf>.

<https://www.researchgate.net/publication/371815621> Gender Inequality in India A Comprehensive Analysis and Implications for Sustainable Development.

<https://www.researchgate.net/publication/373617498> Unveiling Gender Dynamics An In-depth Analysis of Gender Realities.

Pant. B.R.*et all*; 2022: Uttrakhand jansankhya: paridrishya evam parivartan, pahad phaundeshan parikrma Tallital Nainital, 49-266 pp

### (A) LONG QUESTIONS

1. Explain in detail the major social welfare schemes in the state of Uttrakhand?
2. What are the major problems in Uttrakhand in terms of gender equality and what schemes have been implemented by the state government to solve these problems? Analyze with examples.
3. Analyze the reforms made in the field of education in Uttrakhand. What schemes have been started by the state government to improve the level of education, and which of these schemes have proved to be most effective?

4. What are the problems regarding the availability of health services in hilly areas and remote areas in Uttarakhand? Analyze what steps have been taken by the state government to improve health services in Uttarakhand.

**(B) SHORT QUESTIONS**

1. What schemes have been implemented to improve the quality of education of scheduled tribes in the state?
2. What is the status of health services in Uttarakhand and what are the problems in the delivery of health services in hilly areas?
3. What are the government schemes for economically backward classes in the state?
4. Briefly explain some of the major welfare schemes run by the government for the upliftment of women in Uttarakhand.
5. Mention the efforts being made by the Uttarakhand government to improve education in tribal areas?
6. What are the health schemes for women and children in Uttarakhand?

## **BLOCK-3:UTTARAKHAND:URBANISATION, INFRASTRUCTURE AND TOURISM**

---

### **UNIT-8: URBAN GROWTH AND DEMOGRAPHIC TRENDS**

---

#### **8.1 OBJECTIVES**

#### **8.2 INTRODUCTION**

#### **8.3 URBAN GROWTH AND DEMOGRAPHIC TRENDS**

#### **8.4 TRENDS OF UTTARAKHAND URBAN POPULATION**

#### **8.5 CLASSIFICATION OF TRENDS OF URBAN POPULATION IN UTTARAKHAND**

#### **8.6 DISTRIBUTION OF URBAN POPULATION IN UTTARAKHAND**

#### **8.7 SUMMARY**

#### **8.8 GLOSSARY**

#### **8.9 ANSWER TO CHECK YOUR PROGRESS**

#### **8.10 REFERENCES**

#### **8.11 TERMINAL QUESTIONS**

---

## **8.1 OBJECTIVES**

---

- To do an in-depth study of the trends of urban expansion of Uttarakhand state.
- To know the population scenario of Uttarakhand state.
- To identify the possibilities and problems of population resources.
- To identify the urban development possibilities and problems.

---

## **8.2 INTRODUCTION**

---

Historical study of cities shows that the development of cities starts from a rural economy because any city is born from a village. As the population increases and rural activities change, the form of cities changes from town to megacity. As per the standards of the Government of India for defining cities, areas with a population of 5000 to crores are classified as cities which are divided into many administrative units. The development of a city from a village has become a universal process in the world due to which countless cities have developed till the present century and will continue to develop. Urban growth shows the pace of urban area expansion, what is the level of urban growth in a state, what are the reasons for expansion in urban areas, what are the factors accelerating urban development, what changes are taking place in the landform of urban areas due to urban development, how is urban morphology and location expanding, what are the advantages and disadvantages of expansion of cities, describing all these facts are the study aspects of urban growth.

The uneven geographical conditions of the state of Uttarakhand and the concentration of the population in some specific places do not provide equal opportunities for urban growth. If we look at the oldest settlement places of the development of cities in the state, then most of the cities have expanded in the form of hill religious faith centres and natural tourism, which are spread in most hilly areas and river banks. The ancient cities include Govind, Joshimath, (Jyotimath) Kartikeyapur, Brahmapur and Barahat, Uttarkashi, Rishikesh, Haridwar and the medieval towns include Nainital, Mussoorie, Dehradun, Srinagar, Roorkee, Almora, Jageshwar, Bageshwar, Pithoragarh, Lohaghat, Tanakpur, Haldwani, Kotdwar and old Tehri. Administratively, Dehradun, Mussoorie, Nainital, Haldwani and Kashipur were included in the urban area. But at present, 9 Municipal Corporations, 43 Municipal Councils and 50 Nagar Panchayats have been settled as urban areas. Where cities developed as religious places, new cities are expanding at a rapid pace



due to the movement of millions of tourists from all over the country and the world. The main reason for the expansion of cities has been the migration pressure for the last two decades. The migration of the population from rural areas to urban areas is causing unplanned expansion in the area of urban areas. In the plains, before the formation of the state, towns, Nagar Panchayats and Nagar Palikas were formed.

In the last 10-15 years, those towns have been converted into Nagar Panchayats, Nagar Panchayats into Nagar Palikas and Nagar Palikas into Municipal Corporations, whether it is a hilly area or an urban area. Currently, plans are also underway to make the hilly areas of Almora, Pithoragarh and Srinagar into Municipal Corporations, which will be the first hilly municipal corporation areas of Uttarakhand state. The urban growth of Uttarakhand state is providing a rapid pace in the establishment of cities every decade, while urban development is also giving rise to many problems. Rapid urban growth is creating a worrying situation for the landform and environment here. The urban area has expanded four times in the state in the last three decades. At present, the maximum urban growth has taken place in the plain areas (Dehradun, Narendra Nagar, Haridwar, Roorkee, Laksar and Khanpur, Kotdwar, Rishikesh, Jaspur, Kashipur, Garhdpur, Bajpur, Rudrapur, Kichha, Sitaganj, Khatima, Tanakpur, Chaugaliya, Haldwani, Gaulapar, Kathgodam, Kaladhungi and Ramnagar) which are changing the use of fertile agricultural land and constructing concrete buildings in the transformed cities of rural areas which is creating challenges for the local natural resources. Besides this, in the hilly areas, near the roads or in those areas where hill towns have already been established, many hill towns are expanding rapidly in the last 15-20 years.

If the trend of the urban population of Uttarakhand is analysed, it becomes clear that in 1901 the urban population was 1,54,473 persons (7.80%), in 1911 it was 8.46%), in 1921 it was 9.23%), in 1931 it was 8.51%), in 1941 it was 10.34%), in 1951 it was 13.52%), in 1961 it was 13.71%), in 1971 it was 16.34%), in 1981 it was 18.54%), in 1991 it was 22.04%), in 2001 it was 25.74%) and in 2011 it was 30.23%, due to which it is estimated to reach 50% by the year 2050. According to the 2011 census, the urban population of Uttarakhand including cantonments and towns is recorded to be around 30.5 lakh. The state is witnessing a 4 per cent increase in urban population every year. The urban population growth is just short of the national average of 31.16 per cent, which is rapidly giving an urban character to the rural pattern of the population. The concentration of the state's urban

population in the plain districts has been accelerated by industrial development, availability of amenities for human living and means of employment.

Urban expansion has also given rise to many problems in urban areas, in which the possibilities of future developmental activities are also ending, while the settlement of urban centres is happening unevenly. Cities are expanding mostly in the southern plains of the state, while in the mountainous areas, the district headquarters are becoming urban nuclei. The population trends of rural areas are mainly due to the lack of basic facilities in the mountainous region, the disinterest of the mountainous community towards primary occupations, wild animals in agricultural work and extreme weather events, which are accelerating migration in both rural and urban areas. Therefore, most of the cities we have inherited from Uttar Pradesh have been unplanned in terms of population and city planning. Even after many efforts, the cities are not improving at present. In many places, due to excess population, slums have developed where the population is residing like the main urban centres, but due to the lack of roads, drains, parks and cleanliness, there is a low level of urban life. In the same hilly areas also, local migration of the local population towards the road is taking a permanent form. In the last two decades, on average 30-40 percent of the total population in rural areas have left their original places of residence and started living near the road, in which the tehsil complex and development block areas are prominent. These areas are expanding in the form of rural-urban centres, and the trend of population residence has become farmers and employment, whereas, in the hilly areas, the population's residence and life have been of self-reliance for a long time.

---

### **8.3 URBAN GROWTH AND DEMOGRAPHIC TRENDS**

---

**Urbanization and increase in urban population-** There is no direct evidence available about the development, expansion and establishment of urban areas of Uttarakhand, whereas humans entered Uttarakhand along with human civilization, the evidence of which is provided by the heritages of various kings situated in the state and the establishment of the residence centre or dominion of the head of a caste, and it is also clear that no urban area has been able to develop much as an administrative and ancient city centre. Before the establishment of the state, this was a mountainous part of Uttar Pradesh state in which city planning-related works were not visible anywhere. Due to the large geographical spread of the state, the development of cities in the plains has been happening in one direction, which has remained in its earlier state from the historical period till the

present time. Although at present cities have been established in the mountainous regions as well, they have not become employment-rich like the plain areas. Due to the separation of some plain and mountainous regions from Uttar Pradesh on 9 November 2000, urban areas in the state started being established at the administrative level in the form of capital, district headquarters, development blocks and tehsils. But at present 102 municipal body areas have been established as cities, which along with 9 Municipal Corporations, 43 Nagar Palikas and 50 Nagar Panchayats, countless small rural and urban towns have also been built, only from the administrative point of view, they are awaiting demarcation and urban census.

Urban growth in the state of Uttarakhand is currently flowing in the rapid flow of urbanization in which many employment opportunities are being provided by the establishment of industries and small and big markets for economic development. Agricultural areas with rural populations are being merged with urban areas, an example of which are all the new urban areas demarcated in the past years, which have encroached upon rural areas and the rural areas around the urban areas are shrinking, while on the other hand the urban area is expanding. The trend of urbanization in the state of Uttarakhand is a very recent phenomenon because, till the 1990s, the urban areas here were settled in the form of small towns providing services only to the mountainous areas, those centres were Dehradun, Kotdwar, Rishikesh, Haridwar, Ramnagar, Haldwani, Tanakpur, which were settled in the foothills of the state, in which the unavailable materials of the rural areas were available. After the establishment of the state, it rapidly transformed into an urban area and started getting connected to all means of transport at present these old market areas are emerging as satellite centres of many new cities and new cities have also been established in the plains and mountainous areas. There is no district among the 13 districts of the state where urban areas have not expanded. The historical sequence of urban growth or development of the state of Uttarakhand can be described as follows.

**1. Ancient urban areas and growth-** (Before 1815). From the study of the oldest urban gazetteers and other records of Uttarakhand and Uttar Pradesh, it is known that there were no urban areas in any part of present-day Uttarakhand. Human settlements here were in dense forests, mountainous regions and valleys. People used to live in these desolate forests due to fear of foreign invaders and native enemies. There were small caste-based heritages, which are also known as Garh, whose number was around 52 at that time. In these Garhs, the kings' forts, palaces and other administrative buildings were established. Since most of the people were rural economy-oriented, the development of cities could spread only to a

limited level. Nevertheless, religious and historical evidence suggests that Mayapuri, Kartikeyapur, Brahmpur, Govishan and Kankhal, Dwarahat, Srinagar, Joshimath, Mordhwaj and Kotdwar have been areas of urban development. This is currently estimated by historians and geographers. Before the arrival of the Aryans, the state of Uttarakhand was the home of immigrants of Kirat, Shak, Khas, Hun and Naga tribes. The capital of the present Garhwal division used to be Chandpur, which was later shifted to Srinagar, which was the city of that time. In the Kumaon division, the Katyuri and Chand rulers established their capital in Champawat and founded the city of Champawat. Later, when this capital was also shifted to Almora, the foundation of the city of Almora was laid. In the Bhabar Tarai, the city centre of Kashipur was Govishan and the city of Bajpur was considered to be established in the name of Baj Bahadur.

**2. Medieval urban area and growth- (1815 to 1947)-** The medieval urban growth area includes the period in which the foundation of British rule was laid. The British had emphasized establishing cities in the foothills of the mountainous regions to open their business centres so that they could carry out business activities with the people coming from the mountainous regions. The growth in the area of the cities of medieval Uttarakhand started in real form only after the Singoli Treaty between Gorkha and the British because the British were developing railways and roads for business purposes. At the same time, they were also implementing the development of education, health and industries with priority, which strengthened the development of medieval cities. Apart from this, mountainous and valley regions having suitable climates for health were developed as cantonment centres for administrative and state expansion and railway stations were developed for carrying raw and manufactured goods from one place to another, which stations developed as town centres and later took the shape of modern cities.

History books make it clear that the East India Company, to fulfil its selfish interests, laid special emphasis on establishing new urban areas by renovating and expanding old towns. Among the new cities, the major urban centres in Garhwal Mandal were (Roorkee, Mangalore, Jhabreda, Kotdwar, Pauri, Lansdowne and Srinagar) whereas in Kumaon Mandal there were (Kaladhungi, Ramnagar, Bhimtal, Nainital, Haldwani, Kathgodam, Ranikhet, Almora, Bhawali and Tanakpur) etc. Apart from this, urban areas were also expanded based on the accessibility of railway stations and for military cantonments, urban areas were settled separately (Roorkee, Chakrata, Dehradun, Lansdowne, Ranikhet, Nainital, Banbasa and Landour). Among these cities, Almora, Srinagar, Champawat and Joshimadh

were the major commercial cities of the time. It is clear from the census of 1872 that in the year 1872, there were 12 urban areas in Uttarakhand which became 25 in the year 1941.

**3. Modern period urban areas and growth- (1947 till date)-** This period of urban area expansion started after the 1951 census after the independence of the country. After the establishment of administrative headquarters in the hilly areas, transport routes were developed to connect them with the district headquarters and state capitals. By the year 1951, the cities of Devprayag, Clementown, Doghadda, Kirtinagar, Kotdwar, Muni ki Reti, Narendra Nagar, Tehri and Uttarkashi were settled in the state. After the 1961 census, four new cities Jharbeda, Kirtinagar, Muni ki Reti and Pithoragarh were removed from the city category and in their place Raipur and Rudrapur were included in the city category. In the 1971 census, 8 new cities namely Bageshwar, BHEL, Ranipur, Chamali-Gopeshwar, Joshimath, Muni ki Reti, Pithoragarh, Tanakpur and Vikasnagar were developed as urban areas. In the 1981 census, a total of 25 new areas were included in the cities with the expansion of old cities. In 1991 and 2001, 11 new areas each were included in the city category.

Whereas according to the census of the year 2011, 29 new urban areas have increased in the state and due to the non-conduction of the census of 2021, the new areas could not be included in the category of cities, whereas in the delimitation of the year 2024, there is a plan to convert Nagar Palika Almora and Pithoragarh into Municipal Corporation. At present the basis of the expansion of cities and the increase in the number of new cities is considered to be population, based on that, cities are being replaced in mountainous and plain areas. According to the census of the year 2011, the dominance of the urban population is increasing in all the districts of the state. In the present times, with the expansion of the old cities, many urban areas of the state have grown in the form of new cities. Administratively, 102 urban units have been recorded with 9 Municipal Corporations, 43 Municipal Councils and 50 Nagar Panchayats, while in the mountainous regions also, with the establishment of many small markets, city-like structures are getting fully developed in the form of towns. The cities in the state are as centres (Mana, Badrinath, Pandukeshwar, Govindghat, Vishnuprayag, Joshimath, Gopeshwar, Maithana, Nandprayag, Karnaprayag, Rudraprayag, Srinagar, Devprayag, Gangotri, Bhairoghathi, Lanka, Tharali, Sukhitop, Harsil, Dabrani, Ganganani, Bhatwadi, Maneri, Uttarkashi, Dunda, Dharasu, Ganesh Prayag

Devprayag, Gulghati, Shivpuri, Mamuni ki Reti, Rishikesh, Haridwar, Kankhal, Yamunotri, Janaki Chatti, Phool Chatti, Hanuman Chatti, Naugaon, Nainbag, Lakhamandal, Kalsi, Dakpathar, Kedarnath, Rambada, Gaurikund, Sonprayag, Ukhimath, Guptakashi, Bhatwadi, Augustmuni, Rudraprayag, Gangi, New Tehri, in Kausani, Someshwar, Kosi, Betalghat, Ramnagar, Khairna, Dwarahat, Ranibagh, Kathgodam, Haldwani, Kichha, Champawat, Uttarkashi, Lohaghat, Party, Garud, Kapkot, Kara, Gwaldam, Jaiti, Didihat, Dharchula, Muwani, Berinag, Devidhura, Nainital, Bhimtal, Kaladhungi, Haldwani, Chowragalia, Halduchaur, Lalkua, Pantnagar, Khatima, Nanakmatta, Sitaganj, Shakti Farm, Kichha, Doraha, Lalpur, Rudrapur, Dineshpur, Gadarpur, Bajpur, Kashipur and Jaspur are included in the major new urban areas. In the new cities, the maximum population pressure has been in the plain areas.

Till the year 2001, most of the cities were situated in plain areas. The main reason for urban expansion in the plain areas is the migration of the population from the mountainous areas to the plain areas, due to which even small towns are getting converted into cities or municipal corporations in a short period. Whereas in the mountainous areas, the district headquarters which have a population of more than 1 lakh are included in the category of Nagarpalika, but at present, due to the expansion of urban areas in Srinagar, Almora and Pithoragarh, there is a possibility of population pressure and change in the urban category here. The main reason for urbanization growth in the hilly areas is the development of tourism areas and the migration of rural farmers to local small markets. The cities of the hilly areas have not been able to expand as much as the plains, the geographical location of these cities being mountainous and having uneven landforms have been the main reason. Because of the mountain structure, there cannot be much growth in the city, naturally, it acts as a limit barrier to the expansion of the city because most of the areas being transformed into urban structures are located on the river banks or flat peaks of the mountain. Along with historical growth in the cities of Uttarakhand, urban areas are also divided based on population.

### **Development/Growth of Cities based on Population**

In our country, the main basis for the division of urban settlements is considered to be population. Apart from this, the second basis for division is also considered to be the functional form of the population, the category of population employed in secondary and other services. On this basis, that area is given the status of urban settlement. Also, it is

necessary to have Nagar Panchayat, Nagar Nagarpalika, Municipal Corporation, Cantonment Board and Notified Area in the urban area. To get the status of a city, that area must have a population of at least 5000, then it is included in the urban category. Taking these standards as the basis, the urban areas of the state of Uttarakhand are divided into six categories.

- 1. First-class cities** - those cities whose population is more than 1 lakh people.
- 2. Second-class cities** - those cities whose population is from 50 thousand to 99,999.
- 3. Third-class cities** - The city whose population is between 20,000 to 49,999.
- 4. Fourth-class cities** - The urban area whose population is between 10,000 to 19,999.
- 5. Fifth class cities** - The city whose population is between 5000 to 9,9999.
- 6. Sixth-class cities** - The urban area whose population is less than 5 thousand.

The cities in Uttarakhand are mainly divided based on the above categories, the census of the year 1901 has been considered as the first base year for counting the cities based on population. Urban area in 1901 - Known information about the settlement of cities in Uttarakhand is available only after the year 1901. In the year 1901, there were 11 cities in the sixth category (Mussoorie, Ramnagar, Lansdowne, Jhabreda, Ranikhet, Srinagar, Landour, Rishikesh, Kaldhungi, Chakrata and Kotdwar) and 4 cities in the fifth category (Almora, Haldwani-Kathgodam, Nainital and Jaspur), 3 cities in the fourth category (Roorkee, Kashipur and Mangalore), 2 cities in the third category (Dehradun and Haridwar) and none of the cities of second and first category were in the city.

Urban areas in 1951- In the first census after the independence of the country, the number of urban areas in Uttarakhand which was 20 in 1901, became 34 in 1951, in which 14 urban areas had increased, where 13.52 percent of the total population lived. Cities of all the six categories of the above division had been established in the state, in which 17 cities were of the sixth category, 8 cities of the fifth category, 4 cities of the fourth category Kashipur, Mangalore, Nainital and Almora cities, 3 cities of third category Dehradun, Haldwani-Kathgodam and Roorkee, Haridwar in the second category and Dehradun city was included for the first time under the first category, in which 29.2 per cent of the then urban population lived. Dehradun city has remained at the first position from the year 1951 till date, although 8 more urban areas have been included in this limit of the city.

Urban areas in 2001- Actually, the correct information about the growth and settlement places of the cities of Uttarakhand is available only from the census of 2001.



Because till then the urban areas were classified based on a joint census of Uttar Pradesh and Uttaranchal. According to the census of 2001, a total of 86 urban areas had been established in the state, where 25.74 percent of the state's population i.e. more than one-fourth of the population started living in cities. 21 urban centres were in the sixth category, 16 cities each were in the fifth and fourth category, 4 cities of Roorkee, Kashipur, Rudrapur and Rishikesh were included in the second category, while the first category included three urban areas Haldwani-Kathgodam, Dehradun and Haridwar, in which 34.8 per cent of the total urban population lived. Urban areas in 2011 - Due to the rapid expansion of urban areas, in the 2011 census, there are 14 cities in the sixth category, 37 cities in the fifth category, 33 cities in the fourth category, 19 cities in the third category, 6 cities in the second category and 9 cities in the first category. There is a possibility of further expansion in urban areas in the year 2024. Cities or towns are divided based on population, but sometimes changes are made in the urban category even if the population standard is not met, which is discretionary between the government and the administration.

By analyzing the census of the country, it is known that in Uttarakhand, the highest number of sixth-category cities in the urban area was from the year 1901 to 1961, even though the population was higher in the third-category cities. In the year 1971, there was an increase in the fourth-class cities. In terms of numbers, in the years 1981-1991, there was an increase in the number of sixth-class cities, while the population was concentrated more in the first and second-class cities. In the year 2001, most of the rural areas were included in the urban areas, due to which fourth and fifth-class cities registered a rapid increase. According to the census of the year 2011, the maximum population was also concentrated in the cities of this category, but at present, the burden of urban population is increasing more in the first and second-class cities. Along with this, the urban areas are also rapidly transforming rural agricultural villages, in which new colonies are being established by the migrants from the mountainous and rural areas and expanding into the cities of unplanned type, it is becoming a big problem for the cities. The category-wise division of cities in Uttarakhand state is given in Table No. 7.1 as per Census 2011.

**Table No. 8.1 Category-wise division of cities**

Urban Category	Name of cities	Urban population Percentage	Number of cities
First	Dehradun, Haridwar, Rudrapur, Kashipur, Roorkee,	5.2	9



	Haldwani-Kathgodam, Rishikesh, Kotdwar (Almora and Pithoragarh proposed)		
Second	Pithoragarh, Mangalore, Dehradun, Ramnagar, Almora, Srinagar	5.2	6
Third	BHEL, Ranipur, Kichha, Nainital, Raipur, Mussoorie, Sitaganj, Bajpur, Pauri, Tehri, Dhandera, Clementown, Nagla Pantnagar, Laksar, Gopeshwar, Bageshwar	16.5	16
Fourth	Gadarpur, Ranikhet, Landora, Tanakpur, Uttarkashi, Rawal, Central Hope, Town, Jashimath, Khatima, Jagjitpur, Roorkee, Mohanpur, Muhammadpur, Vikasnagar,	28.7	33
Fifth	Padampur, Sultanpur, Pratitnagar, Rudraprayag, Gochar, Someshwar, Garun, Beringag, Thal, Didihat, Mafi, Bhimtal, Karnaprayag, Chamba, Lalkua, Kaladhungi, Bhagwanpur, Dharchula, Bhawani, Gumaniwala, Barkot, Khanjarpur, Shaktigarh Nagla, Shantipuri, Bindukhatta, Imarti, Shahpur, Lansdowne, Saidpura, Khatyadi and Chakrata and others.	32.2	37
Sixth	Pati, Jaunk, Kanchal, Landour, Dwarahat, Mukteshwar, Badrinathpuri, Dugdada, Devprayag, Nand Prayag, Jageshwar, Gangotri, Kedarnath, Khansyu, Padampuri Jagliagaon, Ramgarh etc. Apart from this, most of the development block headquarters have been included in this category.	15.5	14
Total		100.00	115

Source: Indian Census from 1901 to 2011

In the state of Uttarakhand, the level of urban growth is increasing every decade. Just as the percentage of urban growth is increasing in the country, the percentage of urban population is also increasing in the state in parallel. At present, the urban trend has awakened so much that the area around each district and tehsil complex is giving impetus to urban activities in a major way, even if their expansion is limited to a limited area at present. Elements like disinterest in primary occupations in the mountainous areas spreading in the form of urban towns, government support in tourism activities, damage to traditional means

of livelihood due to climate change and reduction in means of employment are working to give impetus to urban expansion, while the establishment of industries in plain areas and the establishment of small markets due to population concentration are helping in urbanization.

---

## 8.4 Trends of Uttarakhand Urban Population

---

Introduction to Urban Population- Population, i.e. human beings, is the best product among the products of nature. The nature of human beings, number discrimination power, working capacity and its mutual relation with other areas, ratio, age, place of residence, lifestyle, food habits, population growth, caste wise comparative mixture of population, literacy, population density, occupational pattern etc. explain the scenario and trends of population. In this scenario, the work done by cities, the way of working, benefits received from that work and contribution to human development, knowledge of population trends is obtained on the basis of problems of birth-death rate, fertility rate, age structure, etc. Because human beings are affected by the use of their natural and cultural environments and bring changes in them. In the study of urban population, various aspects of population such as population growth, residence-migration, its physical strength, age group, and male-female ratio, economic occupation of population and stages of development are specially included. In urban population study, socio-economic characteristics of population such as social organization system of people, residence, economic production, level of education, occupational status, religious beliefs, urban residence etc. are also considered. In the context of uneven geographical features of Uttarakhand, uneven distribution of population, socio-economic diversity and occupational activities, the study of urban population becomes very important. Here, considering urban population from the year 1901 as the base year, trends of urban population in Uttarakhand are mentioned. Analysis of population data shows that the urban population in the state has been different in different decades. Trends of urban population in the state of Uttarakhand can be understood in the following manner.

**1. Trends of urban population in the 19th century-** Although there are no archived records of urban population, but according to Beatrice historian Traill 1924, by the year 1821, there were four cities in Uttarakhand, Almora, Srinagar, Champawat and Joshimath (Jyotrimath), in which 6444 thousand people were engaged in urban business activities. According to the census of the year 1872, the number of cities in Uttarakhand had increased from 4 to 12, which included (Dehradun, Raipur, Landour, Mussoorie, Chakrata,

Kalsi, Kashipur, Jaspur, Almora, Haridwar, Mangalore and Roorkee), while in 1881 the number of cities increased to 18 with 6 new cities (Ranikhet, Naini Lal, Haldwani, Ramnagar and Kotdwar). In the year 1891, Lansdowne, Kaladhungi, Jharbera, Lansdowne and Ranibagh were given the status of urban areas and the number of cities increased to 23, out of which 5 cities registered an increase. The population residing in the cities was mainly engaged in business activities as well as agricultural activities. Because the cities did not have their own resources so that they could depend on the market and provide employment and other essential goods to all the city dwellers.

**2. Trends of urban population in the 20th century-** In the 20th century, the urban population of Uttarakhand resided mainly in Dehradun, Haridwar, Pauri, Almora and Nainital areas, in which 7.80 percent of the total population of 19,79,866 was urban, in which the maximum population was concentrated in Haridwar's Jharbera, Roorkee, Mangalore and Haridwar areas due to being the religious places of Hindus, in which 1,54,473 people, 36.89 percent of the total urban area lived. Dehradun was in the second place with 26.04 percent and Nainital district was in the third place with about 25 percent, Pauri district with 4.47 percent and Almora with 7.67 percent population living in urban settlements. The population trends in different decades of the twentieth century can be understood more clearly on the basis of the following census years. 1. Trends of urbanization in the decade from 1901 to 1921- In Uttarakhand state, the total urban population in 1901 was 1,54,473 in which half of the population was concentrated in Dehradun and Haridwar cities. In the year 1901-1911, there was an increase of 17.3 percent in the urban population but there was no increase in the number of cities. But in Almora city, the highest 38 percent population resided in urban form. Kaladhungi of Nainital district was removed from the category of city.

In the decade from 1911 to 1921, in Uttarakhand too, like the country, a decrease in rural and urban population was recorded. In many areas, the population decreased unexpectedly due to which deaths occurred due to epidemics like malaria and plague spread in this decade. In the year 1921, the urban population in Uttarakhand was only 9.23 percent, in which Almora and Udham Singh Nagar recorded negative growth of 26.6 and 10.9 percent respectively. Nainital and Dehradun recorded growth of 26.2 and 19.4 percent, Haridwar and Pauri recorded growth of 6.9 and 0.5 percent. On an average, the urban population in entire Uttarakhand had registered a growth of 7.7 percent in these decades.

**3. Trends of urbanization in the decades of 1921-1941-** In the census of the year 1921, 9.23 percent of the population lived in the urban areas of Uttarakhand, whose total number was 1,95,277. Dehradun and Haridwar districts had 33.52 and 32.54 percent of total urban population, Nainital district had 14 percent, Udham Singh Nagar had 8.84 percent, Almora had 6.14 percent and Pauri had 4.87 percent urban population. In the same year 1931 census, the urban population of Uttarakhand was 8.51 percent of the total population. Between the years 1921 and 1931, an increase of 0.3 percent was estimated in the urban population. The urban population of Dehradun and Pauri districts had registered a decrease of 1.6 and 18.3 percent respectively. In the same year 1931, Dehradun and Almora cities were placed in the category of cantonment towns. In the year 1931, the total urban population was 1,95,197. The highest population of 32.89 and 32.51 percent was recorded in Dehradun and Haridwar districts. Also, 25 cities in the state were included in the urban limits.

**4. Trends of urbanization in the decade 1941-1961-** According to the census of 1941, the urban population of the state was 2,70,423 which was spread in 25 urban areas. From the year 1931 to 1941, an increase of 38.1 percent was recorded in the urban population. In this decade, the highest growth of 81.8 percent was recorded in Udham Singh Nagar. Pauri and Dehradun were on the second and third positions. No major increase was seen in the urban population of the state in this decade. The total growth has been 4.05 percent. After independence, the first census of 1951 revealed that in place of 25 urban areas, 8 new cities namely Clementown, Devprayag, Dugdada, Kirtinagar, Muni ki Reti, Narendra Nagar, Tehri and Uttarkashi had been established and now the number of cities had become 33 and the urban population was 3,98,296 people. Due to the decade of political upheaval, a negative growth of 22.6 percent was recorded in the population of Udham Singh Nagar and a positive growth of 80.6 percent in Dehradun, 64 percent in Pauri, 40.5 percent in Nainital, 36.5 percent in Almora, 30.5 percent in Haridwar and 21.4 percent in Pithoragarh.

**5. Trends of urbanization in the decade 1961-1981-** In the census of 1961, out of the 33 cities, 4 cities namely Jhabreda, Kirtinagar, Muni ki Reti and Pithoragarh were removed from the category of city and in their place two new cities namely Raipur and Rudrapur were added and the number of urban areas became 31. The maximum population growth took place in Uttarkashi district. The main reason for the increase in urban population was the establishment of offices of new departments in the cities and

implementation of many infrastructural development works during this period, due to which many employees from rural areas started residing in urban areas. 90 percent of the urban population was concentrated in Nainital, Dehradun, Udham Singh Nagar and Haridwar districts. In 1971, 8 new cities were included and the number of urban areas became 39, in which 16.32 percent of the urban population was residing. In the 1971 census, Bageshwar, BHEL, Haridwar, Gopeshwar, Chamoli, Joshimath, Tanakpur Vikasnagar, apart from this Muni ki Reti and Pithoragarh cities were again included in the urban area. In this decade, the maximum number of towns of Udham Singh Nagar were included in the urban area.

**6. Trends of urbanisation in the decade 1981-2001-** In the year 1981, the urban population of Uttarakhand was 10,61,821 persons which was 18.54% of the total population and the number of cities increased from 39 to 64. The highest urban population was in Dehradun district at 34.58% whereas the population in the hilly urban areas was very less. In the 1991 census, 22.4 percent of the total population of Uttarakhand had become urban. The maximum population growth was recorded in Champawat district, while Udham Singh Nagar and Haridwar witnessed an 80 percent increase in urban population. Apart from this, due to high rural migration in small towns located in rural areas, these areas were rapidly transforming into urban structure and the number of cities reached 76. Between 1991 and 2001, 38.3 percent growth was recorded in urban population and 10 new cities were also built. Apart from this, the highest increase in urban population in the current decade was also recorded in this decade. Dehradun was the district with the highest urban population, Haridwar was at second place and Udham Singh Nagar was at third place. Among the hill districts, Nainital was the district with the highest population. Normal growth was recorded in the remaining hill states.

**7. Trends of urbanization in the decade 2001-2011-** Due to the unavailability of population data of the year 2021, only the urban data of the year 2011 is being quoted here. According to the 2011 census, 30.20 percent of the total population of the state is residing in urban areas. By the year 2011, a total of 115 urban areas have been established, whereas after this many urban units have been established in urban areas as Nagar Panchayat and work is being done on the action plan to establish Pithoragarh and Almora as Municipal Corporation in 2024. From 2001 to 2011, a total of 29 new urban areas have been established. The towns with a population of more than 5000 and 75% of the male population is engaged in non-agricultural activities are being included in the urban category. In this decade, an increase of 18.8% has been registered in the urban population. In this decade, the

maximum urban growth and population has been registered in Dehradun district and the remaining 22.9%, Haridwar 18.94%, Udham Singh Nagar 12.28%. The most urbanized districts are Dehradun, Haridwar, Nainital and Udham Singh Nagar, while the districts with the lowest urban population are Bageshwar with 3.49%, Rudraprayag 4.10%, Uttarkashi 7.36% and Almora with 10.01% urban population.

Thus, by analysing the trends of urban population in Uttarakhand state from the year 1901, it is known that 1314.39 percent increase has been registered in urban population, while during this period, an increase of 409.05 percent has been registered in the total population. The number of cities which was 20 in the year 1901 has reached 114 in the year 2011. On one hand, urban areas and population are increasing, on the other hand, rural areas are becoming devoid of population, especially in the mountainous region. The concentration of mountainous population is increasing more towards the mountainous towns. Rural areas are also getting connected to the market economy and are also showing more interest in urban activities, the reason for which is mainly seen to be the lack of basic infrastructure.

---

### **8.5 Classification of trends of urban population in Uttarakhand-**

---

According to the population census, there are 114 urban settlements in Uttarakhand. But most of the urban areas are found in the plain districts because the geographical structure and infrastructure development has also been more in the plain areas. Apart from this, most of the industries and other means of employment in the state are also established in the plain areas, due to which the density and distribution of population has been more in the plain areas because development of infrastructure in the mountainous areas is a very difficult and complex task. Apart from this, means of employment are also found in limited quantity. Also, due to lack of livelihood means and amenities, the settlement of urban areas is less here. At present, religious, natural and adventure tourism related works have provided employment opportunities in the mountainous areas, but due to lack of basic facilities and seasonal employment, it has not been possible to develop cities in the mountainous areas. At present the urban area of Uttarakhand is 392.01 sq. km. area in the hilly urban area and 509.92 sq. km. area in the plain cities. Overall the urban area in the entire state is 901.93 sq. km.

Thus the population growth and distribution of the cities of the state of Uttarakhand is included in the study according to two different geographical units.

**1. Trends and growth of hilly cities-** Since 86 percent of the land of Uttarakhand is mountainous, it is not an easy task to develop a city here. The hilly cities settled at present are the transformed form of some big village in the past. Due to the uneven physical structure, till date only 38 urban areas have been established in the mountainous regions, although many small markets have been established in the form of small rural towns. As per the census of 2011, only 14.56 percent of the population lives in mountainous regions, out of which only Dehradun, Pauri, Nainital, Almora, Champawat, Bageshwar and Pithoragarh have the majority of population. As per the regional expansion, towns are established in 43.46 percent of the total urban area. In the census of 1901, there were only 8 hill towns in which 32,490 people lived and that too in a limited area of the town. After independence, the number of hill towns increased rapidly and the number of towns increased to 19. After independence, it has increased to 38 by the year 2011 but this number is very less in proportion to the general population growth.

The hill urban areas are expanding less than the level at which the population of the state has increased, the main reason for which is rural migration. The population trends are similar to the plain urban areas, the only difference is less in the geographical area and distribution of population as compared to the plain cities, while from the functional point of view, the hill towns are also functioning like the plain cities, due to their seasonal nature, temporary migration of population is more here. (According to B.R. Pant, R. Chand, B.S. Mehta Uttarakhand population scenario and change) in terms of area of hill towns, Uttarkashi is 27.02, Chamoli 39.53, Rudraprayag 12.75, Tehri 63.66, Pauri 59.08, Pithoragarh 16.5, Bageshwar 5.5, Almora 35.68, Champawat 9.5, Nainital 39.68 and Dehradun are spread over an area of 83.36 square kilometers. In which the density of population is respectively Uttarkashi 900, Chamoli 1503, Rudraprayag 778, Tehri 697, Pauri 908, Pithoragarh 4218, Almora 1746, Champawat 1340, Nainital 1441, Dehradun 456 and Bageshwar 1651 persons.

**2. Trends and growth of plain cities-** Actually, the area of cities in Uttarakhand has increased only in the plain areas. In the year 1901, there were 12 cities in the plain areas whose population was 1,21,983 persons. Whereas between 1921 and 1931, a nominal increase of 3.84 percent was recorded in the urban population. In 1941, the number of cities remained 12 only, but after independence, in 1951, the number of plain urban areas increased to 15 and the population increased by 48.12 percent. Thereafter, in 1971, the number of cities increased from 15 to 19 and the urban population increased to 5,78,953



persons. According to the census of the year 2011, the population of the plain cities of Uttarakhand was 77 and the percentage of population was 43.81 percent. Thus, it can be concluded that there has been a rapid increase in urban population in the urban plains every decade due to migration from the hilly areas and Punjab and increase in the number of refugees from Bangladesh etc.

The rapid increase in urban population started with the formation of Uttarakhand state which is currently preparing to take a monstrous form. At present the population density in plain towns is 5074 persons per square km, whereas the expansion of urban structure in plain areas is on a larger scale as compared to mountain areas. (According to B.R. Pant, R. Chand, B.S. Mehta, Uttarakhand Population Scenario and Change) In terms of area, hill towns are spread over an area of Uttarkashi 27.02, Chamoli 39.53, Rudraprayag 12.75, Tehri 67.11, Pauri 71.17, Pithoragarh 16.5, Bageshwar 5.5, Almora 35.68, Champawat 13.04, Nainital 97.88 and Dehradun 272.3 square km, Udham Singh Nagar 122.21 and Haridwar 121.24 square km. In which the density of population is respectively Tehri 8300, Pauri 4752, and Champawat 7236, Nainital 5388, Dehradun 4752, Udham Singh Nagar 4689 and Haridwar 5717 persons.

## 8.6 DISTRIBUTION OF URBAN POPULATION IN UTTARAKHAND-

As per census analysis from 1901 to 2011, the urban population of Uttarakhand has been studied. According to population density, the number of cities with very minimum population distribution of less than 1000 is 19, the number of cities with low population density of 1001-5000 is 65, the number of cities with medium distribution of population of 5001-10,000 is 13, the number of cities with population of 10001-15000 is 10, the number of cities with population of 15001-30000 is 4 and the number of cities with population of more than 30001 is 4, the detailed details of which are given in Table No. 8.2.

Table No. 8.2 Urban Population Distribution

Category	Population	Population Percentage	Number of Towns	Town
Minimum-	Less than 1000	16.52	19	Barkot, Champawat, Lansdowne, Dwarahat, Rudraprayag, Ranikhet, Nagla, Nandprayag, Tehri, Kirtinagar, Pauri, Narendranagar, Nainital Cantonment, Mussoorie, Chakrata, Bhawali, Devprayag, Kedarnath and Gangotri etc.



Minimum	1001-5000	56.52	65	Haldwani Talli, Almora, Haldwani Kathgodam, Vikasnagar, Umru Khurd, Laksar, Saidpura, Bahadarabad, Salempur, Rajputan, Kaladhungi, Jharbeda, Nainital, Shaktigarh Banbasa, Haripur Kala, Jagjitpur, Mehu Wala Mafi, Clement Town, Rawli, Mahdood, Mahelia, Doiwala, Harbatpur, Ramnagar.
Medium	5001-10,000	11.30	13	Dehradun Municipal Corporation, Rishikesh Municipal Corporation, Nathanpur, Pithoragarh Padampur Sukhram, Mukhani, Muni ki Reti, Gadarpur, Padli Gujar, Mohanpur, Muhammadnagar, Dhandera and Gumaniwala.
More	10,001-15,000	8.70	10	Sitaganj, Tanakpur, Roorkee Municipal Corporation, Haridwar Municipal Corporation, Jaspur, Rudrapur, Kotdwar, Dhalwala, Bajpur and Kichha
High	15,000-30,000	3.48	4	Sulhaira, Ramnagar, Landhaura and Kashipur.
Very high	Above 30,000	3.48	4	Sharifar, Fatehpur Range, Mahuva Khera Mangalor etc.

Source: B.R. Pant, R. Chand, B.S. Mehta Uttarakhand Population Scenario and Change

The high density and distribution of population in cities has been mainly responsible for better education, medical facilities and means of employment in urban areas. Many kinds of problems have also arisen due to rapid urbanization. In the last 10-15 years, continuous population growth in plain areas and destruction of fertile agricultural land, decrease in water availability, development of slums, unplanned urbanization, migration from rural areas and food problems are being exposed in the context of urban population. In rural areas, the trend of migration of population is mainly from villages towards roads and plain urban areas. In mountainous areas, the excess of urban population is mostly happening near roads, whereas in urban areas, more population is gathering in unplanned areas and slums. For the

solution of which, there is a need to settle cities according to different and sustainable patterns of urban planning in mountainous and plain areas.

---

## **8. 7 SUMMARY**

---

City historical analysis shows that the development of cities basically starts from rural economy because any city is born from a village. As the population increases and rural activities change, the form of cities changes from town to mega city. The uneven geographical conditions of the state of Uttarakhand and concentration of population in some specific places do not provide uniformity for urban growth. If we look at the oldest settlement places of development of the cities of the state, then most of the cities have expanded as hill religious faith centers and natural tourism, which are spread in most of the mountainous regions and river banks. The ancient cities are Govindashan, Joshimath, (Jyotimath) Kartikeyapur, Brahmapur and Barahat, Uttarkashi, Rishikesh, Haridwar and the medieval cities are Nainital, Mussoorie, Dehradun, Srinagar, Roorkee, Almora, Jageshwar, Bageshwar, Pithoragarh, Lohaghat, Tanakpur, Haldwani, Kotdwar and old Tehri. Urban population trends in the year 1901: Urban population 1,54,473 persons 7.80 percent, in 1911: 8.46 percent, in 1921: 1,54,473 persons 7.80 percent The urban population has increased to 9.23 percent in 1925, 8.51 percent in 1931, 10.34 percent in 1941, 13.52 percent in 1951, 13.71 percent in 1961, 16.34 percent in 1971, 18.54 percent in 1981, 22.04 percent in 1991, 25.74 percent in 2001 and 30.23 percent in 2011, due to which it is estimated to reach 50 percent by the year 2050. According to the 2011 census, the urban population of Uttarakhand including cantonments and towns is around 30.5 lakh.

The state's urban population is growing at the rate of 4 per cent every year. The urban population growth is just short of the national average of 31.16 per cent. The concentration of the state's urban population in the plain districts has been accelerated by industrial development, availability of amenities for human living and means of employment. In the ancient urban areas (before 1815) there were small caste based heritages which were also known as Garhs whose number was around 52 at that time. In these Garhs, forts, palaces and other administrative buildings of the kings were established. The medieval urban areas were developed by the British Government to open trade centres in the foothills of the mountainous regions. In fact, the cities were developed only after the Singoli Treaty. In the

present period, the development of modern cities started after 1951. The number of cities has gone up to 114, in which 30.20 percent of the population of the state is spread over 392.01 sq. km. area in the form of hilly towns and 509.92 sq. km. area in the form of plain towns. The total urban area is spread over 901.93 sq. km.

---

## 8.8 GLOSSARY

---

Rural economy	Means of livelihood in rural areas such as farming, animal husbandry, wood cutting, fishing etc.
Urban morphology	Generally the shape or structure of cities formed by the settlement of cities.
Location Geographical,	latitudinal and longitudinal position and area of a city on the globe.
Rural Town	Mini market area with urban structure which does not completely assimilate the characteristics of a city.
Nagar Panchayat	First category of the stage of urban development in which the population is at least more than 5000.
Nagar Palika	Second stage of urban development in which the urban population is more than 50,000.
Religious city	Haridwar, Rishikesh, Gangotri, Badrinath and other cities settled due to religious activities.
Tourist city	City settled due to natural entertainment and suitable climate from the point of view of health such as Nainital, Ranikhet, Mussoorie.
Ancient city	Those urban areas which were developed in the 18th century and before. Like Joshimath, Kartikeyapur, Govindshaan, Haridwar, Kankhal etc.

---

## 8.9 ANSWER TO CHECK YOUR PROGRESS

---

- A city is usually born after a mutation in the rural economy.

- As per urban standards, an area with a population of more than 5000 and in which 75 percent of the male population is engaged in non-agricultural activities is given the status of a city.
- The cities of Govishan, Joshimath, (Jyotimath) Kartikeyapur, Brahmapur and Barahat, Uttarkashi, Rishikesh, Haridwar are included in the category of ancient cities.
- The cities of Nainital, Mussoorie, Dehradun, Srinagar, Roorkee, Almora, Jageshwar and Haldwani are included in the medieval cities.
- At present, 9 Municipal Corporations, 43 Municipal Councils and 50 Nagar Panchayats have been established as urban bodies in the state of Uttarakhand.
- Dehradun, Narendra Nagar, Haridwar, Roorkee, Laksar and Khanpur, Kotdwar, Rishikesh, Rudrapur and Haldwani-Kathgodam cities are included in the plain cities with the highest urban growth.
- In the year 1901, the urban population of Uttarakhand state was 1,54,473 persons.
- According to the Census 2011, the total urban population of the state has been 30.23 percent.
- According to the Census of the year 2011, the urban population of Uttarakhand including cantonments and towns has been recorded to be about 30.5 lakh.
- The urban population growth rate of Uttarakhand has been estimated at 4 percent per annum.
- The period from 1815 to 1947 has been included in the calculation of medieval urban area, in which the foundation of cities was laid by the British rulers.
- The population of a first class city is more than 1 lakh people.
- The total urban area of Uttarakhand is spread over 901.93 square km.
- Urban bodies with a population of more than 5 thousand are included in the sixth class city.

---

## 8.10 REFERENCES

---

- Maithani, D.D., Prasad Gaytri, Noutiyal Rajesh, 2015. Geography of Uttarakhand. Sharda Pustak Bhawan, University road Prayagraj. U.P.
- OJha. S.K. 2022. Uttarakhand. Baudhik Prakashan. Prayagraj.
- OJha.S.K. 2018, Ecology & Environment. Badfiek Prakasini Prayagraj. UP.

- Pant, B.R. Chand, R. Mehata B.S.: 2022, Uttarakhand Janshankhya Pardrashya Evam Parivartan; Pahad Publication Talalital Nainital. Uttarakhand.
- Sammal. M.S. 2020: Climste change Impact on Agriculture, Food Security & Human Health in Balliya Catchment, Kumoun Himalaya; Unpublished Research Thesis, Kumoun University, Nainital.
- Singh. S. 1974. Physicized Geography, Ecosystem. And Ecology Basundhara Publication Gorakhpur.
- [https://www.Urban Development Directorate \(uk.gov.in\)](https://www.Urban Development Directorate (uk.gov.in))

---

## 8.11 TERMINAL QUESTIONS

---

### *(A) Long Answer Questions*

- Q-1. Explain the urban development process of Uttarakhand and explain the trends of urban population.
- Q-2. Write an essay on urban development of Uttarakhand.

### *(B) Short Answer Questions*

- Q-1. Explain the process of urban development?
- Q-2. What are the population standards for urbanization in Uttarakhand?
- Q-3. Which are the ancient cities, describe them briefly.
- Q-4. On what basis did the medieval cities develop?
- Q-5. Explain the urban trends between 1941 and 1961.
- Q-6. Divide cities on the basis of population.
- Q-7. Throw light on the trends and development of cities located in hilly areas.
- Q-8. How has migration become a problem in urbanization in Uttarakhand?
- Q-9. Tell the characteristics of plain cities?
- Q-10. Mention the trends of urbanization after the year 2011?
- Q-11. Express your opinion on urban development in the mountainous regions of Uttarakhand state and how it can prove helpful in migration and employment?

### *(C) Multiple choice questions*

**Q-2.** City development means birth of.....?

- A) Village
- B) City
- C) Village
- D) None of the above

**Answer A**

**Q-2.** According to urban standards, the minimum population of a city should be..?

- A) 10,000
- B) 5,000
- C) 15,000
- D) 20,000

**Answer B**

**Q-3.** The oldest cities of Uttarakhand include?

- A) Govindashan
- B) Joshimath (Jyotrimath)
- C) Kartikeyapur
- D) All of the above

**Answer D**

**Q-4.** The medieval cities do not include?

- A) Nainital
- B) Mussoorie and Dehradun
- C) Rishikesh
- D) Ranikhet

**Answer C**

**Q-5.** According to the urban census of the year 2011, what was the total number of municipal corporations in Uttarakhand?

- A) 9
- B) 11
- C) 13
- D) 7

**Answer A**

**Q-6.** Which of the following Municipal Corporations has the largest municipal area?

- A) Haridwar
- B) Dehradun
- C) Kotdwar
- D) Rudrapur

**Answer B**

**Q-7.** In the year 1921, the percentage of urban population was...?

- A) 8.51
- B) 9.23
- C) 10.34
- D) 8.46

**Answer B**

**Q-8.** According to the census of 2011, the proportion of urban population of Uttarakhand was?

- A) 22.04 Percent
- B) 25.74 Percent
- C) 30.23 Percent
- D) 34.50 percent

**Answer C**

**Q-9.** According to the census of 2011, what has been recorded as the percentage growth of urban population of Uttarakhand?

- A) 4 percent
- B) 6 percent
- C) 8 percent
- D) 10 percent

**Answer A**

**Q-10.** The population of second class cities is

- A) 50 Thousand To 99,999
- B) 20,0000 To 49,999
- C) 10,000 To 19,999
- D) 5000 Thousand to 9,9999

**Answer A**

**Q-11.** In Uttarakhand, the rural urban area is spread over how many square km?

- A) 425 square kms
- B) 392.01 square kms
- C) 510.20 square kms
- D) 282.10 square kms

**Answer B**

**Q-12.** In Uttarakhand, the plain urban area is spread over how many square km?

- A) 425 square kms.
- B) 392.01 square kms.
- C) 509.92 square kms.
- D) 282.10 square kms.



**Answer C**

**Q-13.** In Uttarakhand, the total urban area is spread over how many square km?

A) 900 sq. kms.

B) 901.93 sq. kms.

C) 810.20 sq. kms.

D) 982.10 sq. kms.

**Answer B**

---

**UNIT-9: INFRASTRUCTURE DEVELOPMENT:  
TRANSPORTATION, ENERGY, COMMUNICATION,  
URBAN PLANNING CHALLENGES AND  
DEVELOPMENT STRATEGIES**

---

***9.1 OBJECTIVES***

***9.2 INTRODUCTION***

***9.3 INFRASTRUCTURE DEVELOPMENT***

***9.4 SUMMARY***

***9.5 GLOSSARY***

***9.6 ANSWERS TO CHECK YOUR PROGRESS***

***9.7 REFERENCES***

***9.8 TERMINAL QUESTIONS***

---

## **9.1 OBJECTIVES**

---

- Understand key challenges in transportation infrastructure development, including accessibility, efficiency, and environmental impact.
- Analyze the complexities of energy infrastructure, focusing on sustainable and renewable energy sources and their integration into existing grids.
- Evaluate communication infrastructure challenges, such as digital connectivity gaps and cyber security concerns.
- Assess urban planning challenges related to rapid urbanization, land use, and the need for green spaces.
- Identify strategic approaches for improving transportation networks, including smart transportation systems and public transit solutions.
- Explore innovative strategies for sustainable energy development and distribution, such as micro grids and energy storage solutions.

---

## **9.2 INTRODUCTION**

---

Infrastructure development in Uttarakhand focuses on improving transportation, energy, communication, and urban planning to support the state's growth and enhance the quality of life for its people. This involves building better roads, railways, and airports, ensuring a steady and clean energy supply, expanding internet and phone services, and planning cities to be more efficient and sustainable. However, these efforts face challenges such as funding, environmental concerns, and technological needs. By understanding these areas and strategies, we can see how Uttarakhand is working to build a better future for everyone.

---

## **9.3 INFRASTRUCTURE DEVELOPMENT: TRANSPORTATION, ENERGY, COMMUNICATION, URBAN PLANNING CHALLENGES AND DEVELOPMENT STRATEGIES**

---

### **What is Infrastructure?**

Infrastructure refers to the fundamental physical systems and facilities needed for the functioning of a society and its economy. It encompasses various types of structures, facilities, and networks that support daily activities, transportation, energy distribution, communication, water supply, and more. Infrastructure is essential for economic development, quality of life, and overall societal progress.

**Types of Infrastructure:**

1. **Transportation Infrastructure:** Roads, bridges, railways, airports, seaports, and public transit systems.
2. **Energy Infrastructure:** Power plants, electrical grids, gas pipelines, and renewable energy installations (solar, wind, hydro).
3. **Water and Sanitation Infrastructure:** Water supply systems, sewage treatment plants, stormwater drainage, and waste management facilities.
4. **Communication Infrastructure:** Telephone lines, internet cables, cell towers, and data centers.
5. **Health Infrastructure:** Hospitals, clinics, health centers, and emergency services.
6. **Educational Infrastructure:** Schools, colleges, universities, and vocational training centers.
7. **Housing Infrastructure:** Residential buildings, affordable housing projects, and community housing.
8. **Public Services Infrastructure:** Government buildings, law enforcement facilities, fire stations, and postal services.
9. **Environmental Infrastructure:** Parks, green spaces, wildlife reserves, and conservation areas.

**What is Infrastructure Development?**

Infrastructure development refers to the planning, construction, upgrading, and maintenance of infrastructure systems to support the growth and functioning of a society. This process involves investment in new projects and the improvement of existing infrastructure to meet current and future demands. Infrastructure development is crucial for economic growth, social well-being, and environmental sustainability.

**Key Aspects of Infrastructure Development:**

- a. **Planning and Design:** Assessing needs, forecasting future demand, and designing infrastructure projects that meet specific requirements.
- b. **Construction and Implementation:** Building new infrastructure or upgrading existing systems, which includes procurement, engineering, and construction activities.
- c. **Maintenance and Management:** Ensuring that infrastructure remains in good working condition through regular maintenance, repairs, and efficient management.
- d. **Financing:** Securing funding for infrastructure projects through government budgets, private investments, public-private partnerships, or international aid.

- e. Sustainability: Incorporating sustainable practices to minimize environmental impact and ensure long-term viability.
- f. Innovation and Technology: Using advanced technologies and innovative approaches to improve the efficiency, resilience, and functionality of infrastructure systems.
- g. Regulation and Policy: Establishing policies, regulations, and standards to guide infrastructure development and ensure safety, quality, and compliance.

**Importance of Infrastructure Development:**

- a. Economic Growth: Enhances productivity, creates jobs, and attracts investments.
- b. Social Well-being: Improves access to essential services such as healthcare, education, and housing.
- c. Connectivity: Facilitates movement of people, goods, and information, thereby boosting trade and communication.
- d. Quality of Life: Provides a safe, clean, and efficient environment for people to live and work.
- e. Resilience: Strengthens the ability of communities to withstand and recover from disasters and other disruptions.

**Infrastructure Development in Uttarakhand**

Infrastructure development in Uttarakhand has been a crucial aspect of the state's growth and progress, given its unique geographical and socio-economic characteristics. Uttarakhand, nestled in the Himalayan region of India, is known for its scenic beauty, pilgrimage sites, and rich cultural heritage. However, the state faces several challenges related to its topography, including rugged terrain, seismic activity, and vulnerability to natural disasters like landslides and floods. Despite these challenges, Uttarakhand has made significant strides in infrastructure development to support its growing population and economy.

Here in this unit, we talk about transportation, energy, communication infrastructure development in Uttarakhand.

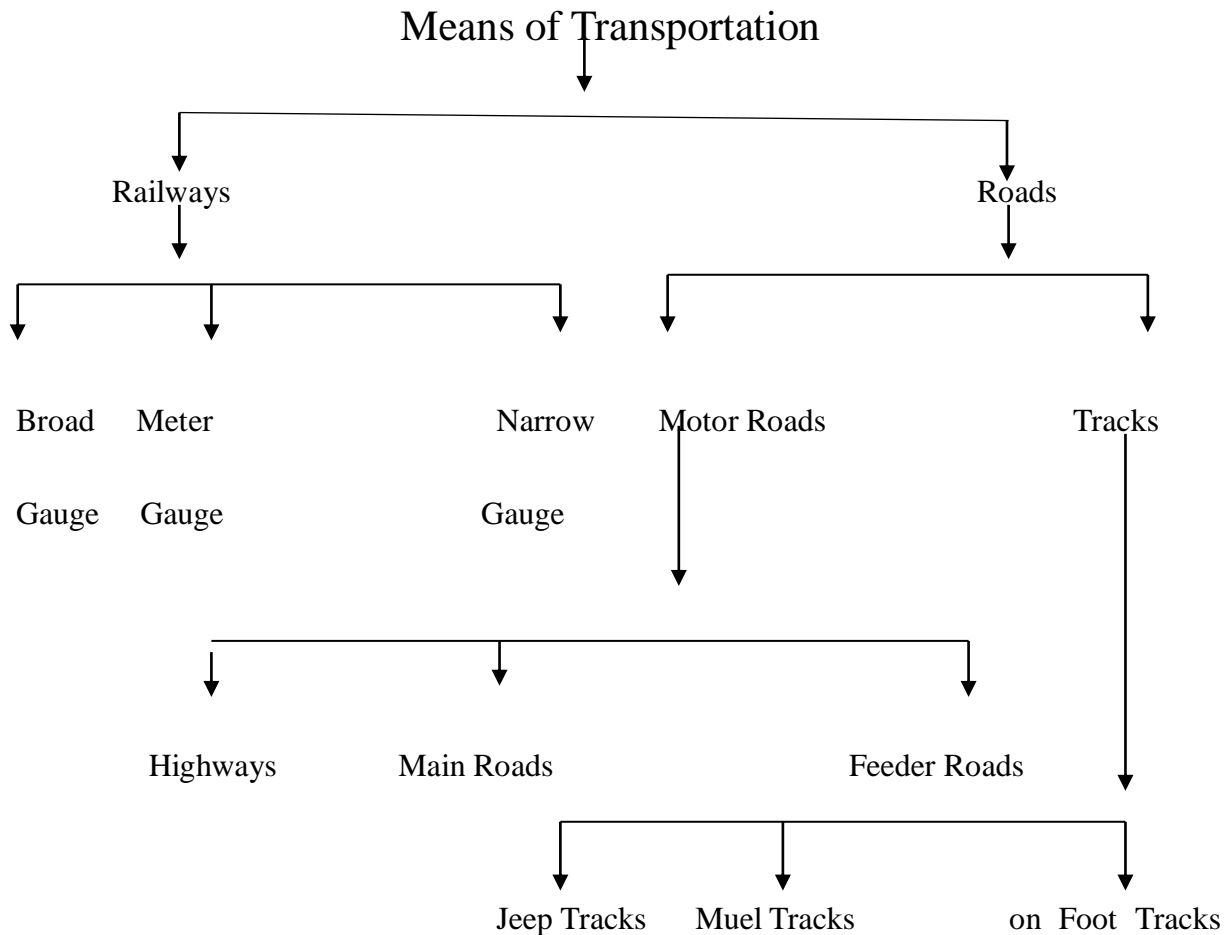
**1. Transportation Infrastructure:** Uttarakhand, known for its picturesque landscapes and spiritual significance, has been actively working on improving its transportation infrastructure to cater to the needs of its residents and tourists. Here's an overview of transportation infrastructure in Uttarakhand.:

"In Uttarakhand, the southern part has good transportation options due to its topography. However, the northern part is more complex and has limited road access. The current

transportation system mainly relies on roads connecting key market centers and some villages."

The existing means of transportation of Uttarakhand can be grouped as follows:

Fig 9.1: Means of Transportation, Source: Dr. S.C Kharkwal



**Road Network:** Uttarakhand has an extensive road network connecting its various cities, towns, and remote areas. The state is known for its hilly terrain, which presents challenges in road construction and maintenance. However, efforts have been made to improve road connectivity, including widening roads, constructing new highways, and implementing measures to prevent landslides.

PWD, BRTF (Border Road Task Force), local bodies and other prominent authorities in the state are entrusted with the task of road construction and maintenance. The State Road Transport Corporation (SRTC), which has been reorganized as the Uttarakhand Transport Corporation (UTC) is a major constituent of the transportation system in the state. The corporation began its operation on 31 October 2003 and provides bus services on inter-state



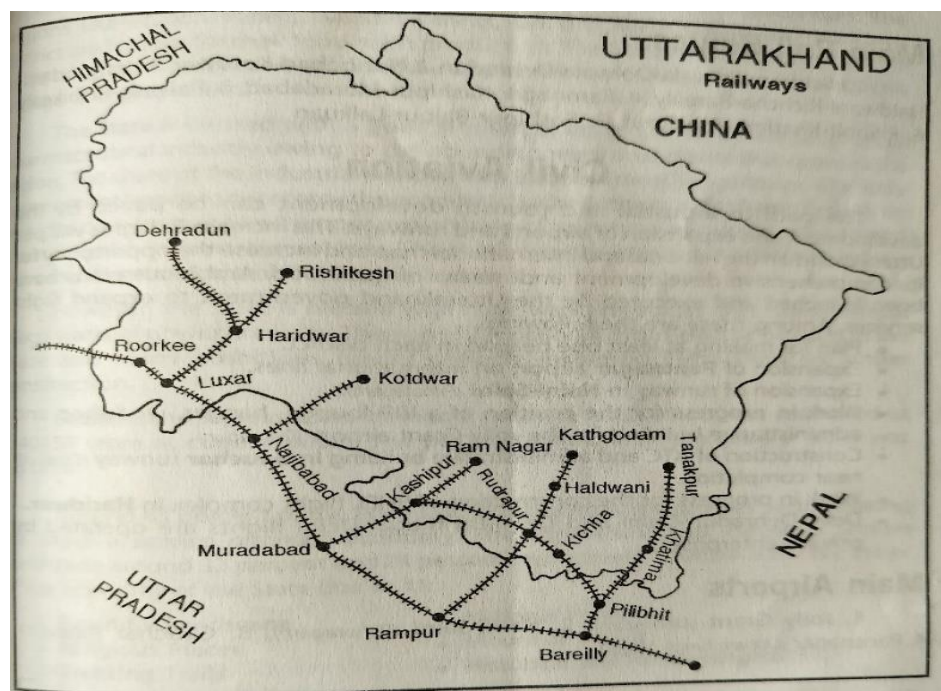


annual footfall of approximately 700,000 passengers and received its first train on April 24, 1884.

There are 43 railway stations in the state, with five primary stations being Haridwar Junction, Kathgodam, Dehradun, Roorkee, and Lal Kuan. Notable stations also include Kashipur Junction, Rudrapur City, Laksar Junction, Raiwala Junction, and Pantnagar, among others. These stations serve as crucial transit points for travelers to religious and tourist destinations, such as Badrinath, Kedarnath, Yamunotri, Gangotri, Hemkund Sahib, Mussoorie, Nainital, and Jim Corbett National Park. Haridwar, in particular, is of great religious importance, drawing millions of pilgrims annually.

Main railway stations of Uttarakhand are: 1. Haridwar, 2. Roorkee, 3. Kotdwar, 4. Kashipur, 5. Haldwani, 6. Kathgodam.

Fig 9.4: Railway Station of Uttarakhand



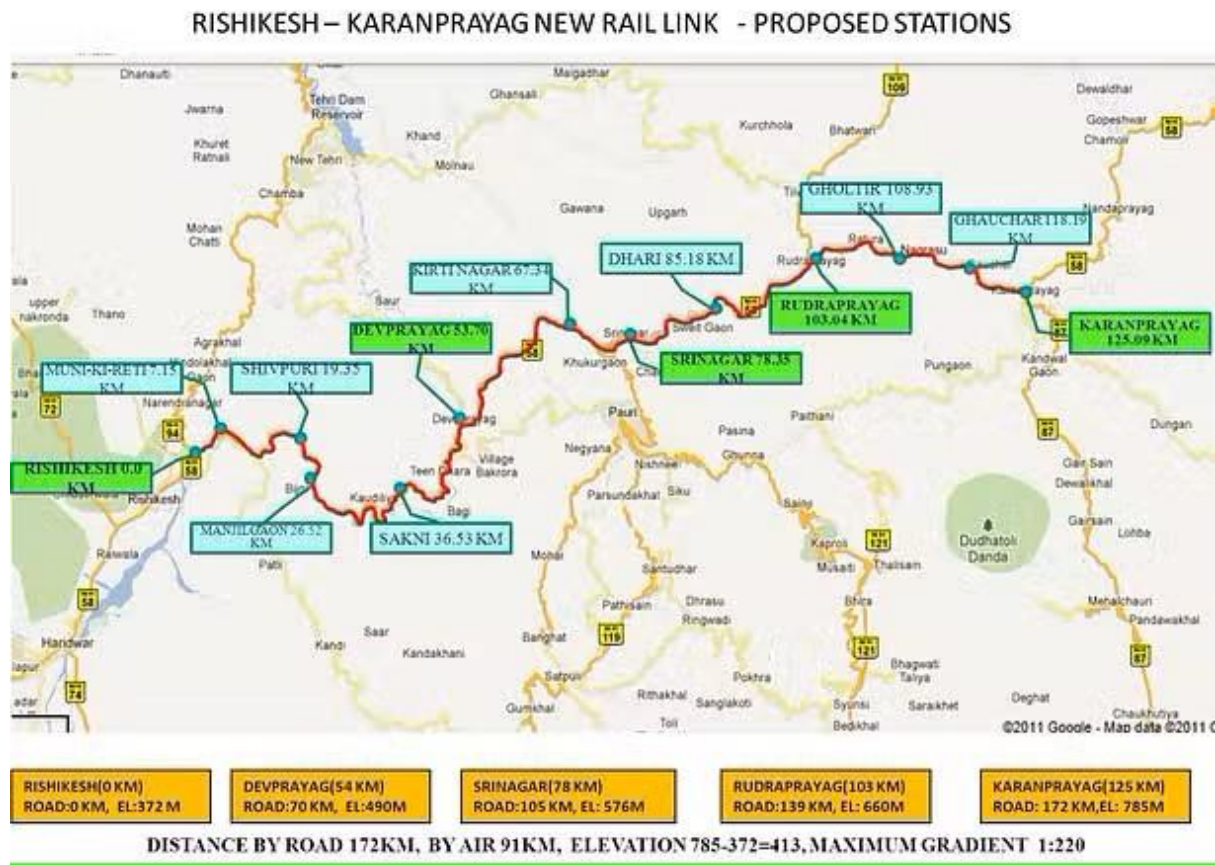
Source: MD Joshi, Know Your State Uttarakhand

Given that over 86% of Uttarakhand's landscape consists of rugged hills, the rail network is largely limited to the plains, making railways a popular mode of affordable transport in these accessible areas. Trains like the Nanda Devi, Haridwar Express, Mussoorie Express, Utkal Express, Kumaon Express, Doon Express, and Shatabdi Express provide essential connectivity, linking Uttarakhand with major Indian cities and enhancing tourism opportunities.



To improve connectivity within the state, the Rishikesh-Karnprayag rail line is currently under construction. This new line, which will be electrified as part of Indian Railways’ 100% electrification goal, is designed to integrate the Char Dham pilgrimage circuit, facilitating access to some of Uttarakhand’s most revered religious sites and marking a major infrastructure advancement in the region.

Fig 9.5: Rishikesh -Karnprayag New Rail Link- Proposed Stations



Source: Google

**Air Transport/Civil Aviation:** Expanding airports and runways can indeed play a pivotal role in fostering industrial and tourism development in Uttarakhand. By enhancing air connectivity, the state can attract more visitors from both domestic and international markets, thereby boosting tourism revenue and creating employment opportunities. Additionally, improved flight services can facilitate the transportation of goods, fostering industrial growth and trade within the region.

The efforts undertaken by the Uttarakhand government to expand flight services demonstrate a proactive approach towards realizing these benefits. Such ambitious plans align with the

broader goal of positioning Uttarakhand prominently on the national and international stage, thereby opening up avenues for comprehensive development and enhancing livelihood opportunities for its residents.

By investing in aviation infrastructure and promoting air travel, Uttarakhand can tap into its vast potential as a tourist destination and leverage its natural beauty, cultural heritage, and adventure tourism offerings to attract a diverse range of visitors. This, in turn, can stimulate economic growth, create job opportunities, and contribute to the overall prosperity of the state.

At present, the state has some main airports are:

- 1. Jolly Grant (Dehradun):** Jolly Grant Airport, also known as Dehradun Airport, is Uttarakhand's primary aviation hub, situated approximately 25 kilometers east of Dehradun amidst the Himalayan foothills. Serving as a key gateway to prominent cities and towns like Rishikesh, Haridwar, Mussoorie, and pilgrimage sites such as Yamunotri, Kedarnath, Badrinath, and Gangotri, it plays a crucial role in facilitating tourism and pilgrimage activities in the region. This strategic location ensures convenient access to Uttarakhand's cultural, spiritual, and natural treasures, making it a vital lifeline for both tourists and locals and contributing significantly to the state's socio-economic development.

Fig 9.6 Jolly Grant



Source: Google

- 2. Pantnagar Airport (US Nagar):** Pantnagar Airport in Uttarakhand is a key domestic airport serving the Kumaon region. It connects tourists to popular destinations like Nainital,

Ranikhet, Jim Corbett National Park, Bhimtal, and Almora. The airport also operates helicopter services, facilitating efficient travel within the state and contributing to tourism and economic development in the region.

Fig 9.7 Pantnagar Airport (US Nagar)



Source: Google

**3.Chinyalisaur Airport (Uttarkashi):** Chinyalisaur Airport, also known as Bharkot Airport, stands out as one of India's most picturesque airports. Nestled on the banks of the breathtaking Tehri Lake and embraced by verdant mountains, it offers travelers a panoramic vista of nature's splendor in every direction.

Located en route to Gangotri Dham in the Uttarkashi district of Uttarakhand, Chinyalisaur Airport derives its name from the nearby village of 'Chinyali' and 'Saur,' meaning plain in the local Garhwali language. This scenic airport not only serves as a gateway to the revered Gangotri pilgrimage site but also captivates visitors with its serene natural surroundings, making it a memorable part of their journey.

**4. Gauchar Airport (Chamoli):** Gauchar Airport is located on the banks of River Alaknanda in the Himalayas, making it a crucial airport for emergency situations. The location benefits from being on one of the largest flatlands in the mountainous region of Uttarakhand, allowing for the construction of a 4,000-foot airstrip between 1998 and 2000, which was later upgraded. Gauchar Airport played a vital role in the rescue and relief efforts during the 2013 North India floods that devastated Uttarakhand in June 2013. On February 8, 2020, the government initiated a helicopter service under the UDAN scheme, connecting Dehradun and

Gauchar. This service aims to assist residents of the Garhwal region by providing a direct link to Uttarakhand's capital city.

**5. Naini Saini Airport (Uttarakhand):** Naini Saini Airport is situated in the picturesque city of Pithoragarh in the Kumaon Region of Uttarakhand. Nestled in the enchanting Naini Saini Hill region, the airport offers a scenic view of the surrounding hills. On the opposite side of the airstrip lies the Defence Agriculture Research Laboratory, adding to the significance of the location.

Fig 9.8: Naini Saini, Airport, Pithoragarh



Source: Google

At some places helipads have been constructed, viz: Raipur (Dehradun), Phata and Narayan Koti (Guptkashi) and Kedarnath (Rudraprayag district).

**Energy:** Solar Energy, Bio-Energy, Wind Energy, Hydro Energy Schemes

Energy infrastructure in Uttarakhand, a state in northern India, includes a mix of traditional and renewable energy sources. The region leverages its geographical advantages, particularly its river systems and hilly terrain, to generate significant amounts of hydroelectric power.

### Hydro Energy

**Introduction of Hydro Power:** Hydro power is a non-polluting, renewable source of energy. It is perhaps the oldest renewable energy technique. Hydro power represents the use of water resources towards inflation free energy due to absence of fuel cost with mature technology characterized by highest primer moving efficiency and spectacular electricity efficiency.

Small Hydro Projects are an important, appropriate and profitable that other energy supply options. Hydro Power projects are generally classified in two parts i.e. Small hydro projects and large hydro projects. In India hydro projects upto 25 MW are considered as small hydro Projects where above 25 MW are considered as large hydro projects.

The small hydro projects are further classified as follows

Class	Capacity in KW
Micro Hydro	Upto 100
Micro Hydro	100-2000
Small Hydro	2000 to 25000

Uttarakhand is rich in water resources, making hydroelectric power a major part of its energy infrastructure. Major Dam in Uttarakhand

Dam Name	District
Teri Dam	Teri
Kishau Dam	Dehradun
Lakhwar Dam	Dehradun
Byasi	Dehradun
Maneri Bhali	Uttarkashi
Dhauli Ganga	Pithoragarh
Pancheshwar	Dam

**a. Uttarakhand Jal Vidyut Nigam Limited (UJVNL):** Uttarakhand Jal Vidut Nigam was formed on 9 Nov 2001 with it's main motto of developing and harnessing the hydro potential of Uttarakhand State. Uttarakhand Jal Vidyut Nigam Limited (UJVNL) is a government-owned organization in the state of Uttarakhand, India.

Uttarakhand Jal Vidyut Nigam limited is primarily responsible for the Small Hydro development in Uttarakhand & is nodal agency to speed up this development. Formerly the small hydro projects were in Uttar Pradesh Laghu Jal Vidyut Nigam limited and thereafter transferred to UP Jal Vidyut Nigam but after formation of Uttarakhand these project came under UJVNL, since then UJVNL (Uttarakhand Jal Vidyut Nigam Limited) has shown serious interest in development of these projects.



It primarily focuses on the generation of hydroelectric power in the state. Established to harness the water resources of Uttarakhand, UJVNL is instrumental in developing, maintaining, and operating hydroelectric projects of various scales within the state. The company aims to promote sustainable energy, reduce reliance on non-renewable sources, and provide a stable and eco-friendly energy supply to the region. UJVNL also plays a role in policy-making, planning, and coordination with other state and central government agencies to further energy sustainability in Uttarakhand.

**b.Tehri Hydro Development Corporation Limited (THDC):** THDC India Limited, also known as Tehri Hydro Development Corporation Limited, is a prominent power utility in India and a joint venture between the Government of India and the Government of Uttarakhand. Headquartered in Rishikesh, Uttarakhand, THDC focuses primarily on generating hydroelectric power. It was initially established to develop, operate, and maintain the Tehri Hydro Power Complex and other hydroelectric projects in the country. THDC is responsible for managing and expanding hydroelectric projects in Uttarakhand, such as the Tehri Dam and Koteshwar Dam, and other projects in the pipeline. These contribute significantly to the state's energy needs.

**C.SJVNL Satluj Jal Vidyut Nigam Limited (SJVN):** SJVNL Satluj Jal Vidyut Nigam Limited has several projects in Uttarakhand, including: Devsari hydropower project on the Pinder River in Chamoli district. Naitwar Mori Hydro Electric Project on the Tons River in Uttarkashi district.

**d. The National Hydroelectric Power Corporation (NHPC):** The National Hydroelectric Power Corporation (NHPC) is a major public sector undertaking under the Government of India, focusing on hydroelectric power generation across India. In Uttarakhand, NHPC plays a crucial role in developing hydroelectric projects, leveraging the state's abundant water resources to produce renewable energy and contribute to regional power stability.

Major NHPC Projects in Uttarakhand:

- i. Tanakpur Hydroelectric Project: Located on the Sharda River, this project has an installed capacity of 94.2 MW and also supports local irrigation and water supply.
- ii. Dhauliganga Hydroelectric Project: This 280 MW project on the Dhauliganga River in Pithoragarh district plays a critical role in stabilizing the region's power supply.
- iii. Pancheswar Dam: A joint Indo-Nepal venture on the Mahakali River (also known as Sharda River), this project is expected to generate substantial power while also

providing irrigation benefits to both countries. However, this project is still in the planning and negotiation phases due to diplomatic, environmental, and technical considerations.

NHPC's efforts in Uttarakhand are crucial in addressing the state's energy needs, promoting sustainable development, and supporting flood control and agricultural irrigation through multipurpose hydropower projects.

**e. Power Transmission Corporation of Uttarakhand Limited (PTCUL):** PTCUL is the primary agency responsible for electricity transmission in the state of Uttarakhand. Established by the Government of Uttarakhand, PTCUL ensures the efficient transmission of power from generation sources to distribution networks, supporting the stability and reliability of the state's power supply.

**Key Roles and Responsibilities of PTCUL:**

- a. **Electricity Transmission Network:** PTCUL is responsible for planning, constructing, operating, and maintaining high-voltage transmission lines and substations across Uttarakhand. It manages the state's transmission infrastructure to ensure efficient and reliable power flow.
- b. **Grid Management and Stability:** PTCUL oversees grid operations, working to maintain power balance and grid stability across the state. This involves coordinating with generating stations and distribution companies to minimize power outages and improve transmission efficiency.
- c. **Infrastructure Expansion:** To meet growing demand, PTCUL continuously expands its infrastructure by adding new transmission lines, upgrading existing facilities, and modernizing substations to improve load capacity and reduce losses.
- d. **Renewable Energy Integration:** As Uttarakhand is a hub for hydropower and other renewable energy sources, PTCUL works on integrating these sources into the state grid. This involves ensuring the grid can handle varying inputs from renewable projects and facilitating interconnections with national and regional grids.
- e. **Corporate Social Responsibility and Safety:** PTCUL is committed to community welfare and safety, implementing best practices for minimizing environmental impact during construction and operation of transmission lines and substations.

- f. Coordination with National and Regional Grids: PTCUL coordinates with the national grid to ensure surplus power from Uttarakhand's hydropower projects can be exported and, in return, that the state receives power in times of demand.

**Major Achievements and Projects:**

- a. Transmission Infrastructure Development: PTCUL has expanded its network to include several high-voltage substations and a vast network of transmission lines to cover remote areas and meet increased demand.
- b. Grid Modernization Initiatives: Upgrades to outdated systems and the installation of advanced technologies have improved operational efficiency and reduced transmission losses.

PTCUL's work is integral to ensuring a reliable power supply in Uttarakhand, especially given the state's mountainous terrain, which poses unique challenges for transmission. By expanding and modernizing its network, PTCUL supports regional economic growth, helps integrate renewable energy, and enhances Uttarakhand's role in India's power sector.

**Solar Energy:** Uttarakhand Renewable Energy Development Agency (UREDA),  
Government of Uttarakhand

The Uttarakhand Renewable Energy Development Agency (UREDA) is a government organization dedicated to promoting renewable energy in the state of Uttarakhand. It functions under the Department of Renewable Energy, Government of Uttarakhand, and is tasked with developing and implementing renewable energy projects, particularly in rural and remote areas. UREDA focuses on harnessing clean energy resources, such as solar, small hydro, biomass, and wind, to reduce dependence on fossil fuels and enhance energy access.

**Key Roles and Responsibilities of UREDA:**

- a. Renewable Energy Project Development: UREDA oversees the planning, development, and deployment of various renewable energy projects, including solar, small hydro, and biomass. These projects aim to utilize Uttarakhand's natural resources and provide sustainable energy solutions.
- b. Promoting Solar Energy: UREDA actively promotes the use of solar energy by setting up rooftop solar installations, solar street lighting, and solar water heating systems, as well as providing subsidies and incentives to encourage adoption among residents and businesses.



- c. Rural Electrification: UREDA plays a significant role in bringing electricity to remote and rural areas of Uttarakhand by deploying renewable energy systems. This is crucial for areas where grid connection is challenging due to mountainous terrain.
- d. Support for Small Hydropower Projects (SHPs): Given the abundant river systems in Uttarakhand, UREDA encourages the development of small hydropower projects (typically below 25 MW) to generate local electricity, reduce grid strain, and support community development.
- e. Biomass and Waste-to-Energy Initiatives: UREDA promotes biomass energy projects, helping convert agricultural waste and other biomass sources into energy, which supports waste management and provides a renewable energy source for rural communities.
- f. Awareness and Capacity Building: UREDA organizes workshops, training programs, and awareness campaigns to educate the public and stakeholders about renewable energy benefits and technologies, as well as to build local expertise for project development and maintenance.
- g. Policy Implementation and Regulatory Support: UREDA works closely with the government to implement renewable energy policies, offering guidance and regulatory support for the private sector to invest in renewable energy in Uttarakhand.

**Notable Projects and Achievements:**

- a. Solar Rooftop Program: UREDA has launched programs for rooftop solar installations on government and residential buildings, with incentives to promote widespread adoption.
- b. Village Electrification with Solar Microgrids: UREDA has established solar microgrids in off-grid villages, ensuring electricity access in remote areas.
- c. Small Hydropower Initiatives: UREDA has helped develop several small hydro projects in collaboration with IPPs and local authorities.

Fig 8.9: Solar Project by UREDA



Source: Google

UREDA's mission aligns with both Uttarakhand's and India's renewable energy goals, helping reduce greenhouse gas emissions, promoting sustainable energy, and improving access to electricity across the state. Its efforts are key to building Uttarakhand's renewable energy portfolio and enhancing energy security while supporting regional socio-economic development.

**3. Wind Power:** While wind power potential is relatively limited in Uttarakhand compared to other states, small-scale wind energy projects are being explored.

### **Communication Infrastructure**

Communication infrastructure refers to the systems and technologies that facilitate the transmission of information and data.

#### **Key Components**

**(i) Telecommunication Networks:** Systems that enable voice and data communication through wired (landlines, fiber optic cables) and wireless (cell towers, satellites) means.

**(ii) Internet Infrastructure:** Includes broadband networks, routers, servers, and data centers that provide internet access and services.

**(iii) Broadcasting Systems:** Television and radio broadcasting equipment and networks that distribute audio and visual content.

**(iv) Postal Services:** Traditional mail and package delivery systems that ensure the physical transfer of documents and goods.

**(v) Emergency Communication Systems:** Infrastructure for emergency services, including 911 systems, emergency broadcast systems, and disaster communication networks.

### **Communication Infrastructure in Uttarakhand Challenges**

**(i) Geographical Barriers:** The mountainous terrain of Uttarakhand makes the installation and maintenance of communication infrastructure challenging and expensive.

**(ii) Remote Areas:** Many regions are remote and sparsely populated, leading to limited network coverage and internet connectivity.

**(iii) Natural Disasters:** Frequent natural disasters like landslides and floods can damage communication infrastructure, disrupting services.

### **Development Strategies**

**(i) Expanding Network Coverage:** Extending telecommunication networks, including 4G and 5G services, to remote and rural areas to ensure comprehensive coverage.

**(ii) BharatNet Project:** Leveraging this national initiative to provide high-speed internet connectivity to rural areas through fiber optic networks.

**(iii) Satellite Communication:** Utilizing satellite technology to reach areas where traditional telecommunication infrastructure is impractical.

**(iv) Public Wi-Fi Initiatives:** Establishing public Wi-Fi hotspots in towns and villages to provide internet access to underserved communities.

**(v) Disaster-Resilient Systems:** Building and maintaining robust communication networks that can withstand natural disasters, ensuring reliable connectivity during emergencies.

**(vi) Digital Literacy Programs:** Promoting digital literacy to ensure that residents can effectively use communication technologies for education, business, and daily activities.

**(vii) Infrastructure Sharing:** Encouraging telecom companies to share infrastructure to reduce costs and improve service delivery in hard-to-reach areas.

**(viii) Government Support and Policies:** Implementing supportive policies and providing financial incentives for private investments in communication infrastructure.

## Major Communication Infrastructure in Uttarakhand

### Personal Communication System

**Internet:** In Uttarakhand, the internet stands out as the most modern and cost-effective personal communication system available today. It allows users to directly interact with others through email and provides access to a vast repository of knowledge and information. The internet functions as an extensive data warehouse, offering detailed information on a wide range of topics. It ensures efficient and affordable access to information through internet services and email, greatly benefiting the residents of Uttarakhand by connecting them to the global community and a wealth of resources. The internet infrastructure in Uttarakhand is a crucial component of the state's overall communication framework, essential for its socio-economic development. Given the state's challenging geography, building and maintaining robust internet infrastructure comes with unique challenges and opportunities.

### Challenges

- (i) **Geographical Barriers:** The mountainous terrain and remote locations make it difficult to lay down fiber optic cables and other physical infrastructure.
- (ii) **Sparse Population Density:** Many areas in Uttarakhand are sparsely populated, making it less economically viable for private telecom companies to invest in extensive infrastructure.
- (iii) **Natural Disasters:** Frequent natural calamities such as landslides, floods, and earthquakes can damage internet infrastructure, leading to frequent service disruptions.

### Current Status

- (i) **Fiber Optic Networks:** Major cities and towns in Uttarakhand have fiber optic networks, but rural and remote areas often rely on slower, less reliable connections.
- (ii) **Mobile Internet:** Mobile internet coverage is expanding, with 4G services available in most urban areas. However, remote areas still experience limited connectivity and slower speeds.
- (iii) **Satellite Internet:** In extremely remote locations, satellite internet provides an alternative, though it comes with higher costs and latency issues.

**Radio:** Radio remains a vital part of the communication infrastructure in Uttarakhand, especially given the state's challenging topography and frequent natural disasters. It plays a crucial role in disseminating information, education, and entertainment, as well as in emergency communication. Here's an overview of the role and importance of radio in Uttarakhand:

Importance of Radio in Uttarakhand

**(i) Geographical Reach:** Radio waves can travel through mountainous terrain and reach remote and inaccessible areas where other forms of communication might fail.

**(ii) Emergency Communication:** During natural disasters such as floods, landslides, and earthquakes, radio serves as a reliable medium for broadcasting emergency information and instructions when other communication networks are down.

**(iii) Educational Tool:** Radio programs provide educational content to students in remote areas, supporting distance learning and literacy programs.

**(iv) Cultural Preservation:** Local radio stations broadcast programs in regional languages and dialects, helping preserve the cultural heritage of Uttarakhand.

**(v) Community Engagement:** Community radio stations allow local voices to be heard, enabling discussions on social issues, local governance, and community development.

Current Status of Radio Infrastructure

**(i) All India Radio (AIR):** AIR operates several stations in Uttarakhand, including in major cities like Dehradun, Almora, and Pithoragarh. These stations broadcast a mix of news, music, cultural programs, and educational content.

**(ii) FM Stations:** Private FM radio stations provide entertainment, music, and local news, enhancing the diversity of content available to listeners.

**(iii) Community Radio:** Several community radio stations operate in rural areas, focusing on local issues, agriculture, health, and education, and providing a platform for community interaction.

Gram Vaani (meaning 'voice of the village') is a social tech company based at IIT-Delhi. Gram Vaani has set up free Mobile Vaani for each of the three community radio stations (CRS)- Kumaon Vani (Mukteshwar), Mandakini Ki Awaz (Rudraprayag) and Henvaivani (Chamba Valley).

### Challenges

- (i) **Limited Coverage:** Despite its advantages, radio coverage can still be limited in the most remote and rugged areas of the state.
- (ii) **Infrastructure Damage:** Natural disasters can damage radio transmission infrastructure, disrupting services.
- (iii) **Technological Advancements:** The rise of digital and internet-based communication platforms presents a challenge to traditional radio, which needs to adapt to remain relevant.

### Development Strategies

- (i) **Strengthening Infrastructure:** Enhancing the robustness of radio transmission infrastructure to withstand natural disasters and ensure continuous service.
- (ii) **Expanding Coverage:** Setting up more transmission towers and relay stations to increase coverage in remote and mountainous regions.
- (iii) **Digital Radio:** Transitioning to digital radio technologies like Digital Audio Broadcasting (DAB) to improve sound quality and provide more channels and services.
- (iv) **Community Radio Support:** Providing financial and technical support to community radio stations to help them operate sustainably and expand their reach.
- (v) **Content Development:** Encouraging the production of diverse and high-quality content that addresses local needs and interests, including educational programs, disaster preparedness information, and health awareness campaigns.
- (vi) **Public Awareness Campaigns:** Promoting the importance of radio and encouraging its use, especially in areas with limited access to other forms of media.

### Key Initiatives

- (i) **Emergency Broadcast Systems:** Implementing robust emergency broadcast systems to ensure timely dissemination of information during disasters.
- (ii) **Educational Programs:** Collaborating with educational institutions to deliver educational content through radio, reaching students in remote areas.
- (iii) **Cultural Programs:** Supporting local artists and cultural organizations to produce content that promotes Uttarakhand's cultural heritage.



By focusing on these strategies, Uttarakhand can enhance its radio communication infrastructure, ensuring that it continues to play a vital role in information dissemination, education, and community engagement.

**Newspaper:** Newspapers play a vital role in the communication infrastructure of Uttarakhand, serving as a primary source of information and news dissemination across the state. Despite the rise of digital media, newspapers remain crucial, especially in rural and remote areas where internet connectivity can be limited. Local newspapers provide residents with updates on regional events, government policies, and socio-economic developments, fostering community awareness and engagement. They also serve as a platform for public opinion, cultural expression, and education, addressing local issues that may not receive national attention. Additionally, newspapers in Uttarakhand often feature content in Hindi and regional languages, making them accessible to a broader audience. Some of the major Newspaper in published in Uttarakhand are Amar Ujala, Dainik Jagran, etc.

**The Internet** is the most modern and cost-effective personal communication system currently accessible. It enables the user to communicate directly with other users via e-mail in order to have access to a world of knowledge and information. The internet serves as a vast data warehouse, containing detailed information on a variety of issues. The network provides efficient and low-cost access to information via the Internet and e-mail.

**Television:** Television has risen to prominence as the most effective audio-visual medium for disseminating information and imparting knowledge to the general audience. When television services first began in 1959, they were exclusively available in the National Capital. After 1972, a number of other centers opened their doors.

### **Urban Planning challenges and sustainable development strategies**

According to the 2011 census, Uttarakhand's urban population, which includes cantonments and census towns, stands at 30.5 lakh. The state's overall urbanization rate is approximately 30.2%, which is close to the national average of 31.2%. While population growth rates differ among districts and urban areas, it is significant that the average annual urban growth rate of 4.0% is substantially higher than the state's rural growth rate of 1.2%.

The urban population in Uttarakhand is primarily concentrated in larger towns such as Dehradun (5.75 lakh), Haridwar (2.31 lakh), and in the agriculturally rich and industrially developed southern regions of the state, including towns like Rudrapur, Roorkee, Kashipur,

and Haldwani. Notably, Dehradun, the state capital and hub of policy-making, has seen a significant increase in its urban population, growing at an average annual rate of over 4% during the decade between Census 2001 and Census 2011.

Urban planning in Uttarakhand faces numerous challenges due to its unique geographical and environmental conditions. Key challenges include:

### **Urban Planning Challenges**

1. **Geographical Constraints:** The hilly terrain makes construction and infrastructure development difficult, leading to higher costs and complex engineering requirements.
2. **Natural Disasters:** The region is prone to earthquakes, landslides, and floods, which pose significant risks to infrastructure and necessitate disaster-resilient planning.
3. **Rapid Urbanization:** Increasing population in urban areas puts pressure on existing infrastructure, leading to overcrowding, traffic congestion, and inadequate public services.
4. **Environmental Degradation:** Deforestation, soil erosion, and pollution from urban activities threaten the region's biodiversity and natural resources.
5. **Limited Connectivity:** Remote and rural areas often lack adequate road and communication networks, hindering economic development and access to services.

### **Sustainable Development Strategies**

1. **Disaster-Resilient Infrastructure:** Implementing construction practices that enhance the resilience of buildings and infrastructure to withstand natural disasters. This includes using earthquake-resistant materials and technologies.
2. **Green Urban Planning:** Promoting eco-friendly urban designs that integrate green spaces, sustainable drainage systems, and energy-efficient buildings. Encouraging the use of renewable energy sources like solar power.
3. **Improved Transportation Networks:** Expanding and upgrading road networks and public transport systems to enhance connectivity while reducing traffic congestion and pollution. Initiatives like the development of helipads and airports can improve accessibility in remote areas.



4. **Waste Management Systems:** Developing efficient waste management and recycling systems to reduce environmental pollution. Implementing waste-to-energy projects can provide a sustainable solution for waste disposal.
5. **Community Involvement:** Engaging local communities in planning and decision-making processes to ensure that development meets the needs of residents and preserves cultural and environmental heritage.
6. **Smart City Initiatives:** Leveraging technology to create smart urban solutions for traffic management, energy efficiency, and public services. This includes deploying smart grids, sensors, and data analytics to optimize urban operations.
7. **Sustainable Tourism:** Promoting eco-tourism and responsible travel practices to balance economic benefits with environmental conservation. Developing infrastructure that supports sustainable tourism while preserving natural landscapes.
8. **Affordable Housing:** Developing affordable housing projects that cater to the growing urban population, ensuring access to safe and adequate living conditions.

---

#### **9.4 SUMMARY**

---

Uttarakhand, a mountainous state in northern India, is focusing on robust infrastructure development across several key sectors to enhance its economic growth and quality of life for its residents. In transportation, the state is expanding its road network, improving national highways, and enhancing connectivity to remote areas. Airports like Dehradun's Jolly Grant and Gauchar are being upgraded, and initiatives under the UDAN scheme are increasing regional air connectivity. In energy, Uttarakhand leverages its hydroelectric potential with major projects like the Tehri Dam, while also investing in solar and biomass energy to diversify its energy mix and ensure sustainability. Communication infrastructure is being bolstered with efforts to enhance digital connectivity and expand internet access, especially in rural regions, through initiatives like the BharatNet project. Urban planning faces significant challenges due to the state's hilly terrain and vulnerability to natural disasters. Rapid urbanization requires sustainable development strategies, including resilient infrastructure, efficient waste management, and eco-friendly urban designs. Addressing these challenges, the state is adopting smart city initiatives and focusing on disaster-resistant construction practices. Overall, Uttarakhand's development strategies aim to create a balanced growth framework that integrates modernization with environmental conservation and resilience against natural calamities.

---

## 9.5 GLOSSARY

---

**Helipad:** A helipad is a designated landing area or platform for helicopters. It can be found on the ground or on elevated structures such as buildings and ships, marked with a large "H" to indicate its purpose. Helipads are crucial for emergency medical services, search and rescue operations, and transport in areas with limited access.

**Broad -gauge:** A broad-gauge is also known as a wide gauge or large line. The distance between the two tracks in these railway gauges is 5 ft 6 in (1676 mm).

---

## 9.6 ANSWERS TO CHECK YOUR PROGRESS

---

Do you know that Infrastructure refers to the fundamental physical systems and facilities needed for the functioning of a society and its economy.

Jolly Grant Airport, also known as Dehradun Airport, is Uttarakhand's primary aviation hub, situated approximately 25 kilometers east of Dehradun amidst the Himalayan foothills.

---

## 9.7 REFERENCES

---

1. Kharkwal, S.C (2018): Uttarakhand Geo-Economic Profile, A Geographical Analysis of Physical, Cultural & Economic Scenario, Winsar Publishing Co. 8 1<sup>st</sup> Floor, K.C City Center 4 Dispensary Road Dehradun- Uttarakhand.
2. Joshi,M.D, Know Your State Uttarakhand, Complete Description of History, Culture, Politics with Growth & Prospects, Arihant Publications(I) Pvt Ltd, Meerut
3. Maithani, D.D, Prasad, Gyatri, Nautiyal, Rajesh, (2015) Geography of Uttarakhand, Sarda Pustak Bhawan Allahabad
- 4.<https://www.cisa.gov/topics/critical-infrastructure-security-and-resilience/resilience-services/infrastructure-dependency-primer/learn/communications#:~:text=Communication%20infrastructure%20consists%20of%20both,satellite>
- 5.<https://www.indeed.com/career-advice/career-development/types-of-infrastructure>
- 6.<https://uk.nic.in/en/infrastructure/>
- 7.[https://energypedia.info/wiki/Energy\\_Situation\\_Uttarakhand,\\_India#:~:text=Around%2096%20per%20cent%20of,in%20less%20so%20in%20villages.](https://energypedia.info/wiki/Energy_Situation_Uttarakhand,_India#:~:text=Around%2096%20per%20cent%20of,in%20less%20so%20in%20villages.)

9. <https://pib.gov.in/PressReleasePage.aspx?PRID=1906322>
10. <https://www.geeksforgeeks.org/communication-infrastructure-of-india/>
11. <https://pib.gov.in/PressReleasePage.aspx?PRID=1906322>
12. <http://www.slbcuttarakhand.com/state-profile-infrastructure.aspx>
13. <https://www.gmuusers.com/#:~:text=Garwal%20Motors%20Users%20Cooperative%20Transport%20Society%20Limited%20has%20redefined%20road,level%20of%20comfort%20and%20safety.>
14. <https://www.redbus.in/travels/garhwal-motor-owners-union-ltd-gmou>
15. <https://www.kmould.in/index.html>
16. <https://uttarakhand.pscnotes.com/uttarakhand-general-knowledge/uttarakhand-economy/transport-of-uttarakhand/>
17. <https://uttarakhand.pscnotes.com/uttarakhand-general-knowledge/uttarakhand-economy/transport-of-uttarakhand/>
18. <https://omms.nic.in/>
19. <https://urda.gov.in/pages/display/2-about-pmgsy>
20. [https://en.wikipedia.org/wiki/Central\\_Public\\_Works\\_Department](https://en.wikipedia.org/wiki/Central_Public_Works_Department)
21. <https://www.prokerala.com/travel/indian-railway/uttarakhand-stations/>
22. <https://ujvnl.com/details.php?pgID=small-hydro-plants>
23. <https://ureda.uk.gov.in/>
24. [https://www.google.com/search?q=Satluj+Jal+Vidyut+Nigam+Limited+project+in+uttarakhand&rlz=1C1CHBD\\_enIN1074IN1074&oq=Satluj+Jal+Vidyut+Nigam+Limited+project+in+uttarakhand&gs\\_lcrp=EgZjaHJvbWUyBggAEEUYOTIHCAEQIRigATIHCAlQIRiPAAtIBCjEwODE3ajBqMTWoAgiwAgE&sourceid=chrome&ie=UTF-8.](https://www.google.com/search?q=Satluj+Jal+Vidyut+Nigam+Limited+project+in+uttarakhand&rlz=1C1CHBD_enIN1074IN1074&oq=Satluj+Jal+Vidyut+Nigam+Limited+project+in+uttarakhand&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIHCAEQIRigATIHCAlQIRiPAAtIBCjEwODE3ajBqMTWoAgiwAgE&sourceid=chrome&ie=UTF-8)

---

## **9.8 TERMINAL QUESTIONS**

---

### **(A) Long Questions**

1. Write on Transport infrastructure in Uttarakhand.
2. Write about the energy and Communication Infrastructure in Uttarakhand.

**(B) Short Questions**

1. What are the key challenges faced in building communication infrastructure in Uttarakhand?
2. Name a project aimed at providing high-speed internet connectivity in rural areas of Uttarakhand.
3. Which medium is considered vital for emergency communication in Uttarakhand?
4. How do community radio stations contribute to local development in Uttarakhand?
5. What is the primary focus of Uttarakhand Jal Vidyut Nigam Limited (UJVNL)?
6. Write a short note on UREDA.
7. Write about the Air Transport in Uttarakhand.
8. Write about the PTCUL.

**(C) MCQ's**

1. Which factor poses a significant challenge to the installation and maintenance of communication infrastructure in Uttarakhand?
  - a) High population density
  - b) Geographical barriers
  - c) Lack of funding
  - d) Overuse of communication networks
2. What is the primary objective of the BharatNet project in Uttarakhand?
  - a) To expand radio coverage in rural areas
  - b) To establish television broadcasting stations
  - c) To provide high-speed internet connectivity in rural areas
  - d) To promote satellite communication technology
3. Which medium is most reliable for emergency communication in Uttarakhand during natural disasters?
  - a) Internet
  - b) Mobile networks
  - c) Radio
  - d) Postal services

4. Which of the following is a key development strategy for enhancing communication infrastructure in Uttarakhand?

- a) Eliminating radio stations in rural areas
- b) Promoting only private investments
- c) Establishing public Wi-Fi hotspots
- d) Focusing solely on urban infrastructure

5. What is the role of community radio stations like Kumaon Vani and Mandakini Ki Awaz in Uttarakhand?

- a) To replace television services
- b) To broadcast national news exclusively
- c) To engage local communities and address regional issues
- d) To promote international radio channels

6. Which organization in Uttarakhand is primarily responsible for small hydro development?

- a) NHPC
- b) UREDA
- c) UJVNL
- d) PTCUL

7. The Tehri Hydro Development Corporation Limited (THDC) is a joint venture between which entities?

- a) Government of India and NHPC
- b) Government of Uttarakhand and UREDA
- c) Government of India and Government of Uttarakhand
- d) NHPC and UJVNL

8. What is a key role of PTCUL in Uttarakhand?

- a) Developing small hydro projects
- b) Promoting solar energy
- c) Managing electricity transmission
- d) Implementing biomass energy projects

Answer: c) Managing electricity transmission

9. Which river hosts the Devsari hydropower project in Uttarakhand?

- a) Ganga River
- b) Sharda River

c) Pinder River

d) Tons River

10. What is full form of UREDA?

a) Uttarakhand Renewable Energy Development Agency

b) Uttarakhand Revenue Energy Development Agency

c) Uttarakhand Renewable Energy Developing Agency

d) Uttarkashi Renewable Energy Development Agency

Answer) 1.b, 2. C, 3.c, 4.c, 5.c, 6.c, 7.c, 8.c, 9.c, 10.a

---

**UNIT-10 TOURISM INDUSTRY: PILGRIMAGE SITES, HILL STATIONS, ADVENTURE TOURISM, CULTURAL HERITAGE: TEMPLES, MONUMENTS, TRADITIONAL ART FORM**

---

***10.1 OBJECTIVES***

***10.2 INTRODUCTION***

***10.3 TOURISM INDUSTRY***

***10.4 ADVENTURE TOURISM***

***10.5 CULTURAL HERITAGE***

***10.6 SUMMARY***

***10.7 GLOSSORY***

***10.8 ANSWER TO CHECK YOUR PROGRESS***

***10.9 REFERENCES***

***10.10 TERMINAL QUESTIONS***

## ***10.1 OBJECTIVES***

---

After studying this unit you will be able to understand:

- The importance of the tourism industry.
- The significance of the tourism sector in Uttarakhand.
- Uttarakhand is an alluring destination for Tourists.
- An overview of adventure tourism and its various types in Uttarakhand.
- Traditional art forms of Uttarakhand..

## ***10.2 INTRODUCTION***

---

Tourism can be defined as the act and process of participating in activities away from one's home, mainly for recreation, relaxation, and enjoyment, while making use of commercially available services. This phenomenon is a result of modern social structures, having originated in Western Europe during the 17th century, although its origins can be traced back to Classical antiquity. Unlike exploration, which often involves discovering the unknown, tourism is defined by its dependence on established routes and services, enabling tourists to enjoy leisure without encountering significant challenges, risks, or social discomfort. Additionally, tourism intersects with various other activities and interests, such as pilgrimage, leading to the development of specific categories like "business tourism," "sports tourism," and "medical tourism," the latter referring to international travel for medical treatment.

By the early 21st century, international tourism had become a crucial global economic activity, with its impact felt from the Arctic to Antarctica. The history of tourism is significant, dating back to before the term "tourist" was coined in the late 18th century. Organized travel, supported by infrastructure and focused on key destinations, can be traced to ancient Greece and Rome, which pioneered "heritage tourism" and beach resorts. The Seven Wonders of the World were major attractions for these civilizations.

Uttarakhand, formerly Uttaranchal, is a northern Indian state known as Devbhoomi, or the Land of the Gods. Predominantly characterized by its mountainous terrain, it shares international boundaries with China to the north and Nepal to the east. This expansive



Himalayan region is a testament to natural beauty and spiritual reverence. The state is divided into two primary regions, Garhwal and Kumaon, each offering a picturesque landscape of mountains, valleys, rivers, lakes, glaciers, and numerous sacred temples. Visitors from across the globe are drawn to Uttarakhand for activities such as skiing, exploring wildlife sanctuaries, river rafting, meditation, and undertaking the Char Dham Yatra. The state's rich religious heritage, marked by its many Hindu temples and pilgrimage sites, significantly contributes to its appeal as a destination for religious tourism.

Uttarakhand, in northern India, is famous for its breathtaking landscapes and diverse activities. Trekking is a major attraction, with trails for both beginners and experienced trekkers. The state also offers wildlife safaris in its national parks and adventure sports like river rafting, paragliding, and rock climbing. Additionally, Uttarakhand is spiritually significant, featuring pilgrimage sites like the Char Dham Yatra and Kumbh Mela. With options for adventure, tranquillity, and spiritual growth, Uttarakhand is a popular tourist destination.

Uttarakhand's diverse attractions, including hill stations, wildlife sanctuaries, pilgrimage sites, and trekking routes, make it a popular tourist destination. The tourism industry drives socio-economic development by creating jobs and fostering economic linkages. The state is developing spiritual and religious circuits and is part of the central government's Swadesh Darshan initiative to promote eco-tourism. Additional themes may include trekking in the Himalayas, Ganga river journeys, culinary tours, and visits to traditional villages. In 2023, Uttarakhand welcomed 70 million visitors, with projections of a 20% increase to 84 million in 2024 (IBEF).

---

### ***10.3 TOURISM INDUSTRY***

---

The tourism industry is complex and cannot be defined as a single product unlike many other sectors, as it encompasses various elements like accommodations, transportation, attractions, etc. In general, tourism can be characterized as the act of individuals travelling and residing in locations outside their habitual environment for less than one year, motivated by leisure, business, health, or other purposes. Often referred to as the travel industry, it involves the movement of individuals to various destinations, whether within their own country or abroad, for recreational, social, or professional reasons. The tourism sector is intricately linked to the hotel

and hospitality industries, as well as transportation services. A significant aspect of this industry revolves around ensuring that tourists are satisfied, engaged, and provided with necessary amenities during their travels. To understand the tourism industry, it is essential to recognize that it encompasses all activities associated with the temporary relocation of individuals from their usual residences. This sector is one of the largest in the world, significantly impacting the economies of many countries through its tourist activities. Furthermore, it is a diverse field that includes not only the hotel and transport industries but also various other sectors.

The tourism sector offers significant economic benefits to nations by attracting visitors who support local businesses and create jobs in transportation and hospitality. It can improve diplomatic relations, enhance leisure opportunities, strengthen currency value, and promote cultural exchanges. Additionally, tourists often experience improved happiness, well-being, and educational enrichment.

A tourist is defined as a person who travels to a location different from their usual social environment for reasons like business, leisure, or social activities. According to commonly accepted standards, a person is considered a tourist if they stay at the selected destination for more than 24 hours but less than one year.

The tourism industry encompasses several key sectors, including transportation, lodging, food and beverage services, entertainment, and related industries such as financial services, travel agencies, tour operators, online travel platforms, tourism organizations, and educational institutions. The primary objective of the tourism industry is to cater to the needs of travellers. Its effectiveness is largely contingent upon the harmonious interconnections among all sectors involved. It is anticipated that this collaborative effort among tourism service providers will result in a favourable experience for each tourist. In essence, tourism is comprised of four principal sectors: (i) Transportation, (ii) Accommodation, (iii) Ancillary Services, and (iv) Sales and Distribution.

### ***Pilgrimage Site***

Uttarakhand, often referred to as the Land of the Gods, truly embodies this designation. Nestled within the majestic Himalayas and alongside the shimmering Ganga and Yamuna rivers, this sacred region is abundant with pilgrimage destinations that provide both divine blessings and

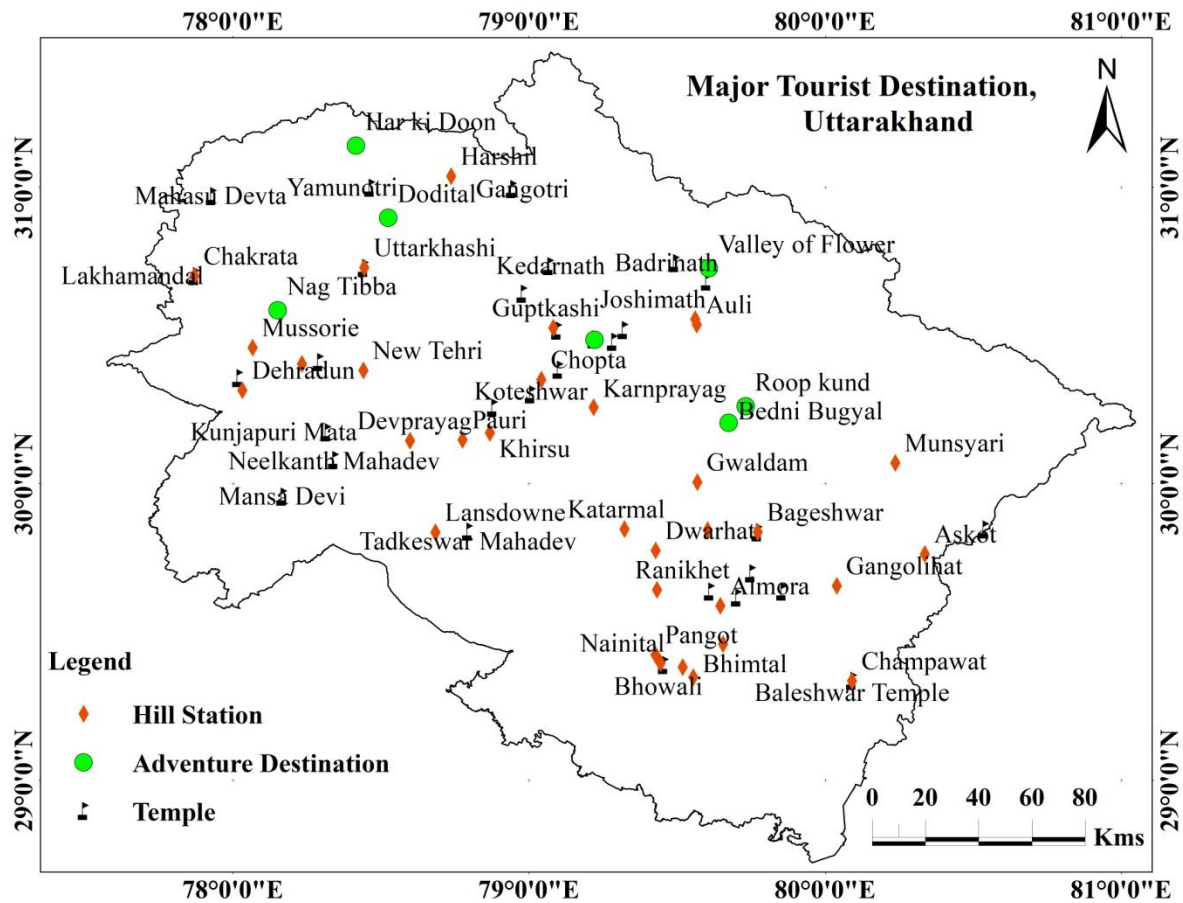
essential tranquillity. The renowned Chhota Chardham Yatra takes place here, encompassing the revered high-altitude Hindu shrines of Badrinath, Kedarnath, Yamunotri, and Gangotri. Additionally, Uttarakhand is notable for its five sacred river confluences, known as Panch Prayags (namely Devprayag, Rudrprayag, Karnprayag, Nandprayag and Vishnuprayag), which further enhance its spiritual significance. The state is also home to the Panch Kedar and Panch Badris, which contribute to its rich spiritual atmosphere. Furthermore, Uttarakhand hosts one of the four Kumbh Mela locations in India, specifically Haridwar. Often regarded as the gateway to the Garhwal Himalayas, Haridwar draws millions of Hindu pilgrims to its temples and the revered Ganges Ghats.

The Chota Chardham Yatra, which promotes pilgrimage to four significant sites located in the remote regions of Uttarakhand—namely Badrinath, Kedarnath, Yamunotri, and Gangotri—has the potential to attract millions of devotees. The spiritual significance of this pilgrimage is so profound that individuals willingly traverse challenging terrains, enduring numerous hardships along the way. It is likely the desire for liberation from the cycle of life that motivates these pilgrims to undertake arduous journeys to the revered temples.

The Panch Kedar Yatra, encompassing Kedarnath, Tungnath, Rudranath, Madhyamaheswar, and Kalpeshwar, particularly appeals to the Shaivite community in India. Situated in hard-to-reach locations, these temples beckon the followers of Lord Shiva, inviting them to receive the blessings of 'The Auspicious One.' Often regarded as the source of the two sacred rivers, Ganga and Yamuna, Uttarakhand is, in reality, a region abundant with numerous flowing streams.

The Kumaon region is distinguished by a multitude of Hindu temples, including notable sites such as Baijnath, Patal Bhubaneshwar, and Jageshwar, each serving as significant religious destinations within Uttarakhand. While the state may appear to be predominantly characterized by Hindu temples, it also accommodates several important sites for adherents of other faiths. Among these is Hemkund Sahib, recognized as the highest Gurudwara in the world, alongside other prominent Gurudwaras such as Nanakmatta and Ritha Sahib, which attract Sikh pilgrims seeking spiritual blessings. For Buddhist devotees, the Mind Rolling Monastery in Dehradun stands out as a principal pilgrimage location, while Muslim worshippers can find numerous

mosques throughout the state, including the renowned Piran Kaliyar Shareef near Roorkee. Additionally, Uttarakhand is home to a variety of churches from the British colonial era, which serve as both aesthetically pleasing and sacred venues for worship. Uttarakhand is home to numerous Jain temples and pilgrimage destinations. Among these, the Digambar Jain Temple in Dehradun stands out as a significant site, drawing a considerable number of worshippers. Additionally, other notable pilgrimage locations include the Shri Digambar Jain Panchayati Mandir in Mussoorie and the Digambar Jain Temple in Haridwar.



**Hill Stations**

Nestled in the breathtaking Himalayas, Uttarakhand is a perfect haven for nature lovers and adventure seekers. This state boasts an impressive selection of hill stations, each offering a unique blend of stunning landscapes, spiritual experiences, and thrilling activities. Whether one is in search of tranquil lakeside retreats, sweeping mountain panoramas, or heart-racing

adventures, Uttarakhand caters to diverse preferences. Adorned with extensive mountain ranges and sparkling landmarks on the global map, Uttarakhand is renowned for its splendid hill stations, which provide all the essential elements for an enchanting holiday experience. The region is marked by awe-inspiring vistas of towering peaks, the snow-capped Himalayas, unspoiled natural beauty, winding trails, and paths lined with lush greenery.

**Table 10.1: Hill Stations of Uttarkhand**

Hill Station	Description
Nainital	Witness The Scenic Beauty
Mussoorie	Gorgeous Snow Ranges
Dehradun	Plenty of Wildlife Havens
Auli	Ski Around
Dhanaulti	Explore The Temples
Kausani	Alluring Views
Khirsu	A Fascinating Place
Pauri	Stunning Sceneries
Ranikhet	A Soothing Escape
Lansdowne	Enthralling Place
Pangot	Watch The Birds
Almora	Serene Paradise
Bhowali	A Hidden Gem
Chopta	‘Switzerland of India’
Harsil	Panoramic Views
Bhimtal	Pristine Lakes
Binsar	Lush Greenery
Chakrata	Try The Thrilling Activities
Chamba	Breathtaking Views
Devprayag	Absolute Serenity
Karnaprayag	Spectacular Backdrops
Guptkashi	Visit The Temples
Abbott Mount	Gorgeous Churches
Askot	Tour The Valleys
Gangolihat	Explore The Caves
Gwaldam	Trek Around
Ramgarh	Perfect For Nature Lovers
Kanatal	Paradisaical Village
Uttarkashi	For Adventure Seekers
Tehri	A Peaceful Paradise
Munsiyari	Astonishing Environment
Bageshwar	Covered With Mountains
Mukteshwar	Dense Forests
Champawat	A Sacred Place
Dwarahat	Astonishing Architecture
Joshimath	A Place For Pilgrims

**Source :** *Internet*

The presence of numerous rivers that flow from the sacred regions of Uttarakhand naturally leads to the expectation of some of the finest hill stations in this area. These hill stations

not only provide breathtaking views of snow-covered peaks during the winter months but also serve as refreshing retreats during the summer, offering respite from the intense heat experienced in the plains. The hill destinations of Uttarakhand are strategically located, bordered by Tibet to the north, Nepal to the east, Himachal Pradesh to the west, and the Ganga plains to the south. The region is characterized by a high level of excitement, attributed to a wide array of adventure activities available. Visitors can engage in trekking, mountain biking, rappelling, paragliding, camping, and jet skiing, among other thrilling pursuits, making Uttarakhand a hub for adventure enthusiasts.

---

## **10.4 ADVENTURE TOURISM**

---

Adventure tourism encompasses various types of tourism that incorporate an element of risk, often requiring physical effort and specialized skills. This form of tourism allows individuals to experience excitement and engage in distinctive activities, prompting them to break free from their routine lifestyles in favour of more daring pursuits. Activities classified as adventure tourism include mountain climbing, bungee jumping, scuba diving, and trekking. While such experiences are available in numerous well-known tourist hotspots, many adventure seekers deliberately pursue secluded areas, distancing themselves from the typical crowds associated with conventional tourism.

Uttarakhand encompasses the mountainous regions of Garhwal and Kumaon, both of which present numerous opportunities for tourism, exploration, adventure, and wildlife observation. Dehradun serves as the interim capital and is the largest city within the state. For adventure tourism enthusiasts, Uttarakhand is replete with exceptional options for trekking, mountain climbing, and white-water rafting. Those interested in peak climbing can experience the thrill of ascending notable summits such as Hathi Parbat, Nanda Devi, Chaukhamba, Kedar Dome, and Bandarpoonch. Additionally, skiing aficionados will find ample opportunities, particularly in Auli, which is recognized as one of India's premier skiing destinations. Furthermore, locations such as Bhimtal, Mussoorie, Mukhteshwar, and Pithoragarh are renowned for their paragliding experiences. Indeed, Uttarakhand offers a diverse array of activities for every type of adventurer.

The state boasts some of the most captivating and scenic trekking routes in India. These intriguing trails, often adorned with vibrant flowers, provide extraordinary and surreal vistas, further amplifying the allure of engaging in adventure activities in this region. The state offers complete freedom to select a trek that aligns with individual preferences, as it features a diverse range of options, including Easy, Moderate, Difficult, and Tough treks. Each category presents its own set of challenges and rewards. Some treks necessitate skills in mountain climbing and rope walking, while others afford breathtaking views of majestic peaks such as Nanda Devi and Trishul, along with opportunities to explore some of Uttarakhand's finest locations. Numerous treks allow for glimpses into rural life and interactions with local communities, while certain routes provide the unique experience of camping beneath a starlit sky in tranquil solitude. Additionally, some treks lead to the revered sites of Kedarnath and Badrinath, as well as trails that unveil the enchanting beauty of the Valley of Flowers.

**Table 10.2: Adventure and Locations of Uttarakhand**

<b>Adventure</b>	<b>Location</b>
Trekking	Bedni Bugyal, Kauri Pass, Har ki Dun, Deoriatal-Chandrashila, Dodital, Roop Kund, Kalindi Khal, Valley of Flower, Hem Kund, Nag Tibba, Kerdar Kantha etc.
Paragliding	Mussoorie, Ranikhet, Naukuchiatal, Mukteshwar, Pithoragarh, Bhimtal
Ziplining	Rishikesh, Mussoorie, Nainital
Canoeing & Kayaking	Rishikesh, Shivpuri
Cable Car Ride	Auli, Bandar punch, Trishul, Om parvat
Bungee Jumping	Mohan Chatti near Rishikesh
Elephant Safaris	Ramgarh and Haridwar
Camping	Kanatal, Dhanaulti, Deoria Tal, Padamapuri, Chopta, Corbett National park, Sattal, Pangot, Binsar Sanctuary, Bhimtal, Rani Chori, Chokuri.
Skiing	The snow-covered mountain peaks of Auli, Nanda Devi, Kamet, Mana Parvat and Dunagiri Peaks
White Water Rafting	Ganges and Tons river, Alaknanda, Dhauliganga, and Kali rivers also have several challenging rapids

**Source :Prepared by Author**

The rivers in Uttarakhand, fed by glacial melt, present an exceptional opportunity for engaging in premier white-water rafting experiences in India. The River Ganga, revered as the



most sacred river in the nation, assumes a dual identity in Rishikesh. On one side, it serves as a spiritual purveyor for devotees who immerse themselves in its waters as an act of faith; on the other, it transforms into a tumultuous and unpredictable force, providing exhilarating rafting challenges. The Tons River, a principal tributary of the Yamuna, parallels the Ganga's significance in Rishikesh, demanding both bravery and skill to navigate its Grade IV rapids. Additionally, the River Kosi, which meanders near the outskirts of Corbett National Park, offers seasonal rafting opportunities.

The state's pristine, snow-covered slopes proudly stand as one of India's premier skiing locales. Auli, located a short distance from Joshimath, attracts skiers globally, eager to experience its exceptional powder skiing. Furthermore, Uttarakhand's diverse landscape facilitates a variety of adventure sports, including paragliding and mountain biking, which are anticipated to gain popularity shortly.

---

## ***10.5 CULTURAL HERITAGE***

---

Cultural tourism refers to a form of tourism driven by the desire to explore and connect with the historical, traditional, and cultural elements of a destination. This type of tourism emphasizes the experience of diverse lifestyles and interactions with local populations, while also contributing to the funding of conservation initiatives. The multifaceted nature of cultural tourism encompasses a variety of activities, such as visiting historical landmarks, museums, and places of worship, participating in local festivals, engaging with artistic expressions, or acquiring knowledge of the local language. Additionally, it provides communities with a chance to benefit from their cultural heritage.

### **Temples**

Uttarakhand is often referred to as the land of Gods, acting as both the abode and sacred land of various deities. Often referred to as Devbhoomi, this area showcases a beautiful fusion of serenity, charm, and spirituality. It is adorned with many well-known and lesser-known temples, each adding to the intricate fabric of religious and cultural importance. Beyond their spiritual significance, these temples hold substantial historical and archaeological value, establishing them as some of the most distinguished temples not only in Uttarakhand but globally. Uttarakhand, renowned for its rich spiritual heritage, boasts a multitude of temples steeped in mythological



tales and cherished traditions. Among these sacred sites, Kedarnath stands out in the Himalayas, while Badrinath, a significant site among the Char Dhams, serves as a venerated temple of Lord Vishnu. The origins of the sacred Ganges and Yamuna rivers are signified by the Gangotri and Yamunotri temples, respectively.

The ancient Jageshwar Temples, characterized by their elaborate architectural designs, honour Lord Shiva and enchant visitors with their enduring allure. Tungnath, situated in tranquil surroundings as the highest of the Panch Kedar, is a sanctuary dedicated to Lord Shiva. Triyuginarayan is renowned for the divine union of Lord Shiva and Goddess Parvati, providing devotees with a glimpse into the essence of divine love and devotion. Each of these temples (Table 10.3) is set against the breathtaking backdrop of the Himalayan landscape, inviting pilgrims to embark on a spiritual journey through the stunning terrain of Uttarakhand.

**Table 10.3: Important Temples of Uttarakhand**

Temples	Location
Badrinath Temple, Hemkund Sahib, Rudranath Temple, Anusuya Devi Temple	Chamoli
Kedarnath Temple, Tungnath Temple, Triyuginarayan Temple, Kartik Swami Temple, Koteswar Mahadev	Rudraprayag
Gangotri Temple, Yamunotri Temple, Kashi Vishwanath Temple	Uttarkashi
Neelkanth Mahadev Temple, Madhyamaheshwar Temple	Pauri Garhwal
Surkanda Devi Temple, Kunja Puri temple	Tehri
Chitai Golu Devta, Jageshwar, Katarmal Sun Temple	Almora
Mansa Devi Temple	Hardwar
Dhari Devi Temple	Srinagar
Naina Devi Temple	Nainital
Tapkeshwar Mahadev Temple	Dehradun
Adi Kailash (Chhota Kailash)	Pithauragarh
Omkareshwar Temple	Ukhimath
Balehsvar	Champawat
Lakhamandal Temple	Chakrata
Badhangarhi Temple	Gwaldam
Bagnath Temple	Bageshwar
Mahasu Devta	Hanol, Chakrata

Tarkeshwar Mahadev	Lansdowne,
Binsar Mahadev	Thalisain,

Uttarakhand is famous for its diverse temples, showcasing various architectural styles, primarily Nagar style, flat-roofed temples, and Katyuri style temples. Nagar-style temples feature a square base with inward-sloping walls, topped with a circular stone and a vase. They often have a small sanctum sanctorum and a surrounding verandah supported by intricately carved pillars, where devotees perform parikrama. Flat-roofed temples are shorter, with stone block roofs and a vase on top. Katyuri-style temples evolved from the Nagar design, with distinct shikharas. The Adi Badri temple exemplifies the Nagar style, while the Katyuri kings built around 150 temples near Almora, including Jageshwar, Dandeshwar, Navdurga, and Mrityunjay.

In Uttarakhand, there exists a multitude of temples dedicated to the worship of Shakti, or the Goddess. Notable among these are Rajarajeshwari, Mahishmardani, Gahayeshwari, Nand Bhadreshwari, Deept Jwaleshwari, Sureshwari, Chapdika Devi, Dakshin Kali, Uma Devi, Chandrabadni, Surkanda Devi, Jwalpa Devi, Ranamandana, Viratakhyia, Kali Mandir, Maya Devi, Mansa Devi, Mundamaleshwari, Mahatkumarika, Sundari Devi, Patreshwari, Hariyani Devi, Dhari Devi, Kali, Rajeshwari, Chamunda, and Kansamardani, among others.

The region of Garhwal is home to a multitude of significant temples, including Koteshwar, Ukhimath, Shiv Prayag, Bhileshwar, Tadkeshwar, Sundeshwar, Pritheshwar, Govardhaneshwar, Ganeshwar, Balkhinileshwar, Shesheshwar, Ratishwar, Markateswar, Pandukeshwar, Daksheshwar, Jaleshwar, Viniteshwar, Varshteshwar, Matkeshwar, Gaurishankar, Pushkeshwar, Neelkantheshwar, Yogishwar, Kilkeleshwar, Mukteshwar, Bhaskareshwar, Sarveshwar, Bhooteshwar, Mrigishwar, Spatikeshwar, Kalish, Vileshwar, Shiveshwar, Umeshwar, Siddheshwar, Jyotishwar, Samdreshwar, Ganeshwar, Kakaleshwar, Kapileshwar, Nageshwar, Ashtamartishwar, and Someshwar. In the Kumaon Mandal, notable temples include Rameshwar, Mukteswar, Shikhareshwar, Vinsar, Jwalpa, Garjiya Devi, Gangolihat, Varahi Devi, Ambika Devi, Akhiltarani, Kali Devi, Poonangiri, Tronagiri, Chitai Golu Devta, Vagiswar, Vyadhranath, Sangad, Baleshwar, Thalkedar, Vibhandekwar, Kapileshwar, Baijnath, and Jayanti, Mainkali, Naina Devi, Kangra Devi, Kasar Devi, Jhula Devi, Pramari Devi, Nanda Devi, Patal Bhuvaneshwar, Ghantakarn, Jogekhar, Surya Mandir, and Someshwar.

## Monuments

Uttarakhand boasts a vast array of Significant National Monuments, yet their existence remains largely unknown to the general public, with only locals aware of them. These notable monuments, recognized for their National Importance, are key tourist attractions in the area. They not only narrate the historical stories of the medieval period during which they were built but also highlight the stunning features of ancient Pahari architecture. Additionally, many other historical sites in Uttarakhand need proper preservation and global promotion to boost the state's tourism industry. The Archaeological Survey of India (ASI) has identified 44 historical monuments in the state that provide valuable insights into its rich past. With a heritage that dates back to prehistoric times, Uttarakhand's natural beauty makes it an appealing destination for domestic and international travellers. Below is a list of Monuments of National Importance in Uttarakhand.

**Table 10.4 : Historical Monuments in Uttarakhand**

Sr. No.	Name of monument(s)	Location	District	
N-UT-1	Badrinath temple	Badrinath	Chamoli	
N-UT-2	Bandeo Temple	Dwarahat	Almora	
N-UT-3	Gujardeo Temple			
N-UT-4	Kacheri group of temples			
N-UT-5	Kutumbari Temple			
N-UT-6	Maniyan group of temples			
N-UT-7	Mritunjaya group of temples			
N-UT-8	Ratan Deo Shrines			
N-UT-9	Surya Temple			Katarmal
N-UT-10	Dandeshwar Temple			Jageshwar
N-UT-11	Chandi-ka-Temple			
N-UT-12	Jageshwar Temple			
N-UT-13	Kuber Temple			
N-UT-14	Mritunjaya Temple			
N-UT-15	Nanda Devi or Nau Durga			
N-UT-16	Nava-grah shrine			
N-UT-17	Pyramidal shrine			
N-UT-18	Shrine dedicated to Surya			
N-UT-19	Monuments	Sitoli		
N-UT-20	Grave of a European Soldier	Uprari		
N-UT-21	Temples of Baijnath: Group of ancient temples, consisting of main shrine of Siva and 17 subsidiary shrines	Baijnath		Bageshwar
N-UT-22	Three temples of the Indo-Aryan shikara type known as Lakshmi Narayan, Rakshas Deval and Satya Narayan	Talli Hat		
N-UT-23	Remains of sixteen temples	Adibadri		
N-UT-24	Fort with walls and ruins of dwelling house inside it and with flights of steps	Chandpur	Chamoli	
N-UT-25	Trident of iron with a shaft with one ancient and three modern inscriptions	Gopeshwar		
N-UT-26	Two Temples	Pandukeshwar		

N-UT-27	Rudranath temple	Gopeshwar	
N-UT-28	Rock Inscription in Survey Plot No. 89	Village Mandal	
N-UT-29	Group of Baleshwar Temples	Champawat	Champawat
N-UT-30	Kotwali Chabutra		
N-UT-31	Naula or covered spring attached to the Baleshwar Temples		
N-UT-32	Temple sacred to Mahasu	Hanol or Onol	Dehradun
N-UT-33	Ancient site	Jagatram	
N-UT-34	The inscribed rock edicts of Asoka	Kalsi	
N-UT-35	Kalinga Monuments	Karanpur	
N-UT-36	Temple and images in its vicinity	Lakha Mandal	
N-UT-37	Old Cemetery	Roorkee	Haridwar
N-UT-38	Old Cemetery	Shaikhपुरi & Ganeshpur	
N-UT-39	Remains of ancient buildings locally identified with Vairatapattana	Dhikuli	Nainital
N-UT-40	Old temple sacred to Sita	Sitabani	Pithoragarh
N-UT-41	Patal Bhubaneswar Caves	Patal Bhubaneswar	
N-UT-42	Remains of a few old temples and an inscribed masonry well	Gangoli Hat	
N-UT-43	Excavated Site at Dronasagar (only preliminary notification issued)	Kashipur	Udhamsingh Nagar
N-UT-44	Excavated site and Remains	Purola	Uttarkashi

**Source:** *Archaeological Survey of India (ASI)*

### Traditional Art Forms

The role of art in the evolution of human culture is of profound importance. Since ancient times, individuals have conveyed their observations and emotions through artistic expressions, reflecting the natural world around them. This practice has contributed to the formation of a tangible cultural identity. Art has evolved continuously, embodying a sacred aspect of human perception and serving as a manifestation of the human spirit. Its emergence is not confined to a specific location or era; rather, it has flourished across various civilizations, shaped by their unique environments. In today's globalized society, however, there has been a noticeable decline in the authentic expression of feelings and emotions in art. Each cultural era's folk art exhibits unique characteristics and trends, evident in various forms such as architecture, crafts, painting, and sculpture. In addition to its stunning natural landscapes, Uttarakhand boasts a rich heritage of diverse art forms, including jewellery making, wooden craft, painting, and the decoration of temples. It is evident that the arts of Uttarakhand, along with its local artisans, draw significant inspiration from the surrounding nature. Regardless of one's artistic inclination, the rich history and significance of Uttarakhand's beautiful art forms are sure to evoke a sense of intrigue and admiration.

The Uttarakhand region of India is celebrated for its diverse artistic expressions, including painting, architecture, and sculpture, influenced by the Kumaon and Garhwal areas. Art in Uttarakhand dates back to prehistoric times, with Kumaon featuring a unique architectural style called 'Himadri' and notable rock paintings found at sites like Lakhu Udhiyar. Temples in Jageshwar, Almora, and other locations exemplify post-Gupta architectural aesthetics. Kumaon is also known for its sculptural style and the Pahari Kalam painting tradition, while the Garhwal School of Painting evolved from Mughal miniatures, with notable works in the University Museum in Srinagar. The region boasts a rich tradition of folk arts, including Aipens and Peeths for painting, along with clay idols, woollen textiles, metalwork, and wood carving. Traditional crafts also include gold, silver, copper, and brass ornaments featuring ancient designs.

- 1. Aipen** is a revered folk art form in Uttarakhand, primarily practised by women in the Kumaon region. This ritualistic art features traditional patterns and motifs, believed to be derived from the term "Arpan." Aipen designs adorn floors, doors, and walls during auspicious occasions and have been passed down through generations. Characterized by repetitive geometric patterns, artists enjoy creative freedom without strict compositional rules. As an indigenous variation of Rangoli, Aipen holds cultural and religious significance for the Kumano community. Unlike other Indian Rangoli styles that use colourful powders, Aipen is made with finely ground rice mixed with water, applied by hand on a dark backdrop.
- 2. Wall paintings** represent a significant artistic tradition in Uttarakhand, deeply embedded in the region's historical and cultural narrative, despite having remained largely unrecognized for many years. This art form is prevalent throughout Uttarakhand and has garnered appreciation from art enthusiasts globally due to its aesthetic appeal and grandeur. The most notable examples of these wall paintings can be found in the Kumaon and Garhwal regions, where they boast a rich heritage that has only recently come to the attention of the international art community, highlighting the remarkable skill and intricacy involved in this craft. Historically, the wall paintings of Uttarakhand served both decorative and ritualistic functions, while also possessing considerable aesthetic significance.
- 3. The miniature painting** tradition of Uttarakhand represents a significant school within the broader context of Indian miniature art. Notably, the Mughal prince Sulaiman Sukoh arrived in this region during his exile, bringing a cadre of painters and the influences of Mughal

miniature art. While its roots are in the Mughal miniature painting style, Uttarakhand's artistic expressions have evolved into distinct characteristics over time. The region's breathtaking natural landscapes naturally drew the attention of artists and poets alike. Additionally, its secluded location amidst the towering Himalayas often provided refuge for those seeking to escape from the outside world.

- 4. Architecture:** Uttarakhand boasts numerous pilgrimage sites with unique temple architectures, including Kedarnath, Badrinath, Tungnath, and Madmaheshwar. The Kedarnath temple, built in the 8th century by Adi Shankaracharya, is renowned for its grandeur and is located on a ridge amidst snowy mountains, near the ruins of an earlier temple linked to the Pandavas. Its inner sanctum features various deities and mythological scenes, with a prominent Nandi Bull statue at the entrance. Constructed from large, precisely cut gray stone slabs, the temple raises questions about ancient construction techniques. Inside, there is a Garbha Griha for the deity and a Mandap for pilgrims, along with a revered conical rock formation representing Lord Shiva in his Sadashiva form.
- 5. Wooden Art/Craft:** Wood art encompasses a diverse array of exquisite figures crafted from various types of wooden materials, including planks and logs. This artistic expression is recognized in two primary forms: the creation of functional wooden objects and the production of decorative art on wood. Each form holds its own unique significance; one serves practical purposes while the other is primarily ornamental. The tradition of wood art has flourished in Uttarakhand, where remarkable examples of wood carving can still be observed on ancient structures such as buildings, forts, and temples. Intricate carvings adorn door frames, doors, and windows, while wooden pillars within homes feature a variety of figures. The artistry includes depictions of deities, animals, birds, flowers, and foliage, showcasing the exceptional skill involved in wood craftsmanship. However, modern construction trends favour machine-made items over hand-carved pieces, leading to a decline in traditional wood art and undervaluing the work of wood artists.
- 6. Handicraft:** Handicrafts encompass a variety of traditional practices, including the creation of jewellery, agricultural tools, utensils, weaving, sewing, and printing. In the region of Uttarakhand, a segment of the population has historically engaged in jewellery making, known as goldsmithing. This craft involves the intricate design and production of gold and silver ornaments. Goldsmiths traditionally crafted items such as Nathuni, Bulak, Gulband,

Locketts, Murkhule, Bangles, Hansli, Ghaguli, Murkhula, Panchhi, Kada, Laccha Bujni, Chandrahaar, and Peeta Sheeshphool, showcasing their artistic skills. However, the production of these traditional ornaments has significantly declined, giving way to modern jewellery alternatives. Similarly, individuals who manufacture agricultural tools are referred to as blacksmiths. They produce a range of implements essential for farming. The craft of utensil making has also been practised in this region since ancient times, with artisans creating items from brass and copper. In Kumaon, the production of copper utensils was particularly common, yet this craft is also facing decline as it is increasingly supplanted by mass-produced steel utensils. Garment production in Uttarakhand, particularly by the Bhotiya community, is known for its intricate woollen textiles. Bhotiya artisans use both imported and local sheep wool to create items like Chutka, carpets, fans, pattusaul, and Thulma. The Thulma-making process, unique to their culture, involves combing and stitching wool to specific dimensions. For over 150 years, Thulma from Johar has been distributed across India. Bhotiya carpets feature Tibetan-inspired designs and use natural dyes from various local sources. Despite the region's unparalleled woollen artistry, this traditional craft is declining due to a lack of government support.

---

## ***10.6 SUMMARY***

---

Describing Uttarakhand is challenging due to its global recognition as Devbhoomi, known for its numerous temples and vibrant spiritual tourism. The region's stunning Himalayan landscapes attract visitors, while its rich cultural heritage is reflected in traditional attire, cuisine and folk dances such as Langvir Nritya. The community is shaped by the Kumaoni and Garhwali populations, along with other ethnic groups like Jaunsari and Tharu. Many locals live in slate-roofed houses and farm-terraced fields. culture of Uttarakhand, influenced by various races and dynasties, is expressed through its history, religious practices, and dances that explore life's themes. Uttarakhand is also famous for the Char-Dham pilgrimage, earning its title as God's Land. Its simple yet flavorful cuisine often features meat, especially during village temple inaugurations.

Uttarakhand, known as the "Land of Gods," offers a variety of activities for visitors, from trekking in stunning Himalayan landscapes to white-water rafting. For those seeking tranquillity, yoga and meditation retreats abound, while wildlife enthusiasts can explore national parks to see



rare species. With its diverse offerings, Uttarakhand ensures an unforgettable experience. Beyond its natural beauty, Uttarakhand is rich in historical landmarks, featuring ancient temples and forts that tell the story of its cultural heritage. Exploring these sites allows visitors to connect with the region's past, making it essential for anyone wanting to appreciate its grandeur. The folk art and paintings of Uttarakhand are vital to its cultural identity, reflecting local religious and mythological narratives. From intricate Pahari paintings to simple Chitai artworks, each style showcases the artists' creativity. Engaging with these art forms is crucial for understanding Uttarakhand's rich cultural traditions.

---

## 10.7 GLOSSARY

1. **Tourism:** Tourism involves activities related to travel and exploration, where individuals visit destinations outside their usual environment for leisure, business, or other purposes, significantly contributing to economic and cultural exchange between regions.
2. **Tourist:** A person who travels to a destination for leisure or exploration purposes.
3. **Business Tourism:** Business tourism, or MICE (Meetings, Incentives, Conferences, and Exhibitions) tourism, involves travel for business purposes, encompassing various activities that support business operations and networking.
4. **Sports Tourism:** Sports tourism involves traveling to participate in or watch sporting events, blending sports enthusiasm with leisure activities. It includes attending major competitions, engaging in recreational sports, and visiting sports-related attractions.
5. **Medical Tourism:** Health-related travel, often referred to as medical tourism, involves individuals traveling to different countries to receive medical care, treatments, or procedures that may be more affordable or accessible than in their home countries.
6. **Museums:** Museums are dedicated spaces for the preservation, study, and exhibition of art and artifacts. They often focus on specific themes, periods, or types of art.
7. **Monuments:** Monument refers to buildings, monuments, or other constructions that hold importance due to their historical, cultural, architectural, or social value.
8. **Natural Landscapes:** Natural landscapes refer to areas of land that are primarily shaped by natural forces rather than human activity. This includes mountains, forests, rivers, deserts, and coastlines.



9. **Lakhu Udhiyar:** Situated in Barechhina village along the banks of the Suyal River in the Almora district of Uttarakhand, prehistoric paintings on the walls of these caves represent some of the most significant artistic heritage in India.
10. **Peeths:** Peeth is a sub-genre of Aipen, a decorative and ritualistic art from Uttarakhand, primarily practiced by women in Kumaon and Garhwal. Its traditional methods and motifs are integral to the broader 'Aipen' drawing tradition, celebrated during important religious and social events across India.
- 

### ***10.8 ANSWER TO CHECK YOUR PROGRESS***

---

**1. Which of the following does not belong to the Panchkedar?**

- a. Jageshwar
- b. Rudranath
- c. Madhyamaheswar
- d. Kalpeshwar

**Answer: a.**

**2. Which of the following does not belong to the Panch-Prayag?**

- a. Devprayag
- b. Keshavprayag
- c. Rudraprayag
- d. Nandprayag

**Answer: b.**

**3. Where is the famous Sun Temple located?**

- a. Joshimath
- b. Dwarhat

- c. Katarmal
- d. Ranikhet

**Answer: c.**

**4. Where is the Kacheri group of temples located?**

- a. Joshimath
- b. Kausani
- c. Dwarhat
- d. Badahat

**Answer: c.**

**5. Where is the Grave of European Soldier located?**

- a. Munsyari
- b. Dharchula
- c. Uprari
- d. Kichha

**Answer: c.**

**6. Where is Mahasu Temple located?**

- a. Hanol
- b. Chakrata
- c. Kalsi
- d. Tyuni

**Answer: a.**

**7. Where are the rock edicts inscribed by Ashoka located?**

- a. Chakrata
- b. Kalsi
- c. Sahastradhara
- d. Nanakmata

**Answer: b.**

**8. The distinctive architectural style found in Kumaon is known as -**

- a. Anchal
- b. Himani
- c. Himadri
- d. Parag

**Answer: c.**

**9. The Lakhu Udiyar having ancient rock paintings is located in which district ?**

- a. Champawat
- b. Bageshwar
- c. Nainital
- d. Almora

**Answer: d.**

**10 Which specific style influences Uttarakhand's miniature paintings?**

- a. Mughal
- b. Gorkha

c. European

d. Palas of Bengol

**Answer: a.**

---

## 10.9 REFERENCES

---

- <https://traveltriangle.com/blog/hill-stations-in-uttarakhand/>
- <https://charmachan.com/best-hill-stations-to-visit-in-uttarakhand-your-guide-to-himalayan-bliss/>
- <https://plutotours.in/places/activities-in-uttarakhand>
- <https://www.euttaranchal.com/tourism-theme/hill-station-1.php>
- <https://www.euttaranchal.com/tourism-theme/monuments-of-national-importance-103.php>
- Kharkwal, S. C. (2017). Uttarakhand A Geographical Analysis of Physical, Cultural & Economic Scenario (in Hindi), Winsar Publication, PP. 37-83
- Kharkwal, S. (2001). Garhwal Himalaya (Nature, Culture & Society). Srinagar Garhwal : Transmidia Publication House.
- Maithani, D. D., Prasad, G. and Nautiyal, R. (2010). Geography of Uttarakhand (in Hindi), Sharda Pustak Bhawan, Allahabad. PP. 36-68.
- Tripathi, K. N. and Kumar, A. (2013-14). Uttarakhan: General Studies, Nagri Press, Alopibag, Allahabad.
- Khan, R. A. and Thapa, G. S. (2021). Prayag Uttarakhan: General Knowledge with Latest and Rare Facts, Ankit Prakashan, Haldwani (Niainital).

---

## 10.10 TERMINAL QUESTIONS

---

1. Why is Uttarakhand famous as a tourist destination?
2. What are the best places to visit in Uttarakhand during the summer?
3. What are the most popular architectural styles of Uttarakhand?
4. What are the best adventure activities in Uttarakhand?
5. Which are the most adventurous places for trekking in Uttarakhand?
6. What are the historical places to visit in Uttarakhand?
7. What is the role of tourism in the economy of Uttarakhand?
8. What is the importance of pilgrimage sites of Uttarakhand for tourism?

9. What is the importance of hill stations of Uttarakhand for tourism?
10. What is adventure tourism?
11. What is the importance of temples as tourist destinations in the context of Uttarakhand?
12. Throw light on the traditional art forms of Uttarakhand.

## **BLOCK 4: UTTARAKHAND: DISASTER RISK AND MANAGEMENT AND SUSTAINABLE DEVELOPMENT CHALLENGES**

---

### ***UNIT- 11 GEOLOGICAL AND CLIMATE INDUCED HAZARDS: EARTHQUAKES, LANDSLIDE, FLOODS, DROUGHTS, AVALANCHES AND DISASTER PREPAREDNESS AND MITIGATION STRATEGIES***

---

#### ***11.1 OBJECTIVES***

#### ***11.2 INTRODUCTION***

#### ***11.3 MAJOR TYPES OF FIELD METHODS IN BIOGEOGRAPHY***

#### ***11.4 SUMMARY***

#### ***11.5 GLOSSARY***

#### ***11.6 ANSWER TO CHECK YOUR PROGRESS***

#### ***11.7 REFERENCES***

#### ***11.8 TERMINAL QUESTIONS***

## ***11.1 OBJECTIVES***

---

After reading this unit you will be able.

- To understand the meaning of hazards and disaster.
- To explain the classification of natural and man-made hazards.
- Know about major geological and climate induced hazards in Uttarakhand.
- Know about in detailed the major geological and climate-induced disasters that occurred in Uttarakhand.

## ***11.2 INTRODUCTION***

---

Hazards are events or conditions that occur on the Earth's surface that are caused by environmental and anthropogenic factors. Hazards are all around us and can occur without warning, making it difficult for humans to adjust and seriously affecting human life, property and the environment. According to the United Nations, "An outbreak is a potentially harmful physical event or human action that can cause harm to human life, damage to property, social and economic destruction or environmental degradation." They come in many forms, from natural disasters to technological accidents. Understanding hazards is important because it helps us be prepared and reduce the risks we face. By knowing what hazards we may face, we can take steps to protect ourselves, our homes, and our communities. According to the United Nations Commission on Human Settlements (UNCHS), Hazard is such harmful physical events that have the possibility and capability to cause immense damage to human life and property in residential areas. Outbreaks may or may not be disasters. If they occur in inhabited areas they become disasters, otherwise they remain mere extreme events in uninhabited areas.

Hazards can be divided into two categories: natural hazards and man-made hazards. Natural hazards occur as a result of the Earth's natural processes that can cause significant human and environmental damage. These include events such as earthquakes, which are sudden ground movements caused by vibrations of the Earth due to tectonic movements; floods, which result from excessive rainfall or river overflows; hurricanes, which are powerful tropical storms with strong winds and heavy rainfall; wildfires, which can be started by lightning during prolonged drought conditions. Natural hazards often occur with very little warning and can have devastating effects on communities and the environment. On the other hand, man-made hazards, also known as anthropogenic hazards, are events resulting from human activities that pose risks to health, property, and the environment. Man-made outbreaks include industrial accidents, such as chemical leaks or explosions in factories, pollution that can contaminate the air, water and soil, and infrastructure failures, such as dam collapses or fires in buildings. These hazards are often the result of negligence, lack of proper maintenance or inadequate safety measures. While

some man-made outbreaks can be reduced through better planning and regulation, others can be mitigated through better planning and regulation.

The Himalayas, one of the youngest mountains in the world, are geologically unstable and tectonically most active. As a part of the Himalayan range, the state of Uttarakhand has a mountainous topography which makes it one of the most disaster-prone states in the country. Geological instability or hydro-meteorological variability is the main cause of disasters in the state. Avalanches, landslides, flash floods, cloudbursts, earthquakes, droughts and forest fires are all potential hazards for the state.

Climate risks arise from a wide range of hazards. Some risks have a gradual impact such as droughts or damage to agriculture due to changes in temperature and precipitation, while others have a sudden impact such as Avalanches, earthquakes, and flash floods.

---

### ***11.3 MAJOR GEOLOGICAL AND CLIMATE INDUCED HAZARDS: EARTHQUAKES, LANDSLIDE, FLOODS, DROUGHTS, AVALANCHES AND DISASTER PREPAREDNESS AND MITIGATION STRATEGIES***

---

Climate-Induced Risks are the threats that arise due to climate change. These risks can have a negative impact on natural disasters, environmental changes and human life. Climate change is causing temperature rise, changes in rainfall patterns, sea level rise and many other problems. Let's understand them in detail:

**1. Earthquakes:** Earthquake is a natural hazard in which the energy generated from inside the earth is suddenly released, causing vibrations and waves in the geographical structures. It is usually caused by landslides, volcanic eruptions, or collision of earth's plates. The energy generated during an earthquake is felt as vibrations and tremors on the surface of the earth. The intensity and consequences of an earthquake are measured on the basis of the Richter scale. This Richter scale was created by Charles F. Ritter in 1935. The numbers marked on this scale (which indicate the intensity or magnitude of the earthquake - M.) are between 0 to 9 scale. So far, an earthquake of magnitude 9.3 (at the time of Sumatra tsunami, 2004) has been recorded on the Richter scale. It is known that if the result on the Richter scale decreases by one point, then the number of earthquakes increases tenfold. Apart from this, another scale Mercalli scale is also used to measure earthquakes.

Some of the important earthquakes of Uttarakhand are mentioned below:

**1829 Earthquake (Kumaun-Garhwal region):** This earthquake occurred in the Kumaun and Garhwal regions of Uttarakhand. It was very powerful and caused massive destruction in many places. A large number of buildings and houses collapsed.

**1906 Earthquake (Gangotri and Yamunotri regions):** This earthquake was felt in the Gangotri and Yamunotri regions, and many temples and religious places were damaged due to it.



**1934 Nepal-India Earthquake:** This earthquake was felt in Nepal and parts of Uttarakhand. This earthquake was quite intense and caused massive destruction in Nepal. It also caused some damage in Uttarakhand.

**1991 Earthquake (Garhwal region):** This earthquake was felt in the Pabau and Uttarkashi districts of the Garhwal region in 1991. More than 100 people were killed in this earthquake and many houses and buildings were damaged.

**1999 Earthquake (Uttarkashi-Chamoli region):** This earthquake was quite powerful in Uttarkashi and Chamoli districts. This earthquake also damaged some structures, but there was no large-scale loss of life.

**2001 Earthquake (Garhwal region):** A moderate intensity earthquake struck the Garhwal region in 2001, the impact of which was felt in many areas. Although this earthquake did not report any major loss of life, it was considered as a warning that geological activity remains in the Uttarakhand region.

**2011 Earthquake (Uttarkashi-Chamoli region):** A powerful earthquake struck Uttarkashi and Chamoli districts of Uttarakhand. The magnitude of this earthquake was measured at 6.1 on the Richter scale. However, this earthquake was relatively deep, so there was no loss of life in the region.

**2015 Earthquake (Nepal):** The impact of the earthquake in Nepal (which had a magnitude of 7.8) was also felt in some parts of Uttarakhand. This earthquake was very powerful and caused massive destruction in Nepal, while Uttarakhand suffered minor damage.

**2020 Earthquake (Garhwal and Kumaun Region):** A mild earthquake was felt in Uttarakhand in 2020. Its magnitude was around 5.0 on the Richter scale. Although, there was no major damage from this earthquake, this incident highlights the seismic sensitivity of Uttarakhand.

**2023 Earthquake (Kumaun Region):** Earthquake tremors were felt in the Kumaun region in 2023. The epicenter of this earthquake was in the Kumaun region and the magnitude was up to 5.2. Although, this earthquake did not cause any major loss of life, panic spread in the region.

Fig.11.1 Earthquakes in Uttrakhand



Source: Google image

Fig.11.2 Earthquakes in Uttrakhand



Source: Google image

**2. Landslide:** Landslide is a natural or man-made disaster in which a large portion of the earth's surface slides away. Landslide is the process in which soil, rocks, debris or other types of material slide down a hill or slope. When this landslide disaster occurs in human

inhabited areas, it becomes a disaster. Generally hilly and mountainous and steep coastal areas are vulnerable to landslides. Due to which there is a huge loss of life, property and environment in the areas downstream of the landslide sites. Uttarakhand is a hilly state, famous for its majestic Himalayan mountain ranges and rugged terrain. Uttarakhand has historically witnessed many major landslide events, which are related to the state's geography, weather, and human activities. Due to its sensitive geographical location and heavy rainfall during monsoon, landslides are a common problem in Uttarakhand. It not only affects road traffic but also poses a serious threat to human life and property. Some of the major examples of landslides in the state are described below.

**2010 Landslide (Pauri Garhwal):** A massive landslide occurred in Pauri Garhwal district in 2010 following heavy rains. This landslide cut off the connectivity of many villages, and affected hundreds of people. The landslide also blocked roads and destroyed a lot of agricultural land. Many people died and property was lost.

**2013 Kedarnath Disaster:** The 2013 Kedarnath disaster can be considered a major landslide event. Heavy rains and snowfall caused rivers to overflow, and at the same time large boulders and debris flowed down the mountains. This disaster killed more than 6000 of people and destroyed a large amount of property and infrastructure, breaking down roads and bridges in Kedarnath and the surrounding area. The landslide completely devastated the Kedarnath shrine and surrounding areas.

**2016 Pithoragarh Landslide:** Heavy rains in 2016 caused several landslide events in Pithoragarh district. These events completely disrupted road traffic and cut off many villages. Landslides also damaged homes and farms. A major landslide event in Pithoragarh injured several people and killed some.

**2018 Chamoli Landslide:** Several landslides occurred in Chamoli district in July 2018 following heavy rains. One of these major landslide events blocked the road connecting Rudraprayag and Chamoli district. Due to heavy debris, villages and farms suffered a lot and in some places the lives of villagers were also at risk. This incident again highlighted the danger posed by landslides.

**2020 Haldwani Landslide (Kumaun region):** Heavy rains in October 2020 caused a landslide in Haldwani of Kumaun region. It caused the walls and roofs of many houses to collapse. Traffic was also disrupted and roads were closed. Many people were affected after losing their lives, while others were shifted to safer places.



**Fig.11.3 Landslide in Kumaun Region, Uttrakhand**



Source: Google image

**Fig.11.4 Landslide in Garhwal Region, Uttrakhand**



Source: Google image

**3. Flood:** Flood is a natural disaster in which the water level raises much more than normal, causing rivers, streams, and reservoirs to break their banks and flood the surrounding areas. It occurs due to various reasons such as excessive rainfall, melting of snow, dam or reservoir

failure, lack of sanitation and drainage system, land encroachment, climate change, etc. Flood can cause devastation, especially when it spreads on a large scale. Flood causes problems like damage to basic infrastructure such as roads, bridges and buildings, deterioration in the economic condition of communities dependent on agriculture and water resources, increase in health problems, spread of waterborne diseases like malaria and dengue, etc.

**1998 Kumaun Flood:** In July 1998, Kumaun region was hit by heavy rainfall for 4-5 days continuously, which caused the water level of many rivers to rise and flood situation spread across the region. Flood water entered various villages and buildings were destroyed, crops were ruined, many major roads and bridges were washed away and there was heavy loss of property. This flood affected Almora, Bageshwar, and Nainital districts.

**2003 Tehri flood:** Intense rainfall in July 2003 and overflowing of reservoirs, coupled with lack of drainage system, led to flooding in Tehri region. It caused massive destruction in the villages situated along the river. Many villages were submerged and hundreds of people were displaced. The flood caused massive damage to agricultural land and drainage system. Crops were destroyed and road connectivity was disrupted.

**2013 Kedarnath Flood:** This event is considered to be the biggest example of floods and landslides in Uttarakhand. Heavy rains and snowfall, glacier break and sudden snow melt due to inadequate drainage led to a sudden rise in water level in Kedarnath and surrounding areas. This led to flood situation due to rising water level of Alaknanda and its tributaries. Along with this, massive landslides completely devastated the Kedarnath area. The flood caused massive destruction in the Kedarnath temple and surrounding villages. About 5,000 people were killed and thousands were injured. Traffic came to a complete standstill due to debris and flooding. There was heavy loss of crops, land, and property.

**2016 Ramganga Flood:** Continuous heavy rainfall and sudden rise in the water level of the river caused flooding in the Ramganga River in the Kumaun region of Uttarakhand. The flood caused water to enter many villages and surrounding areas, inundating fields and houses, destroying crops, flooding roads, fields, and houses, washing away roads and bridges, causing massive traffic disruptions, and heavy property damage.

**2020 Chamoli Flood:** On 7 February 2020, excessive rains in Chamoli district led to a rise in the water level in the rivers due to glacier break and snow melting, flood occurred after the glacier break, the flash flood increased the water level in the Alaknanda and Dhauliganga rivers and caused massive destruction in the surrounding areas. Landslides and floods devastated many villages, many people were swept away and trapped in the debris, roads, bridges, and reservoirs etc. were affected.



**Fig.11.5 Ramganga flood Kumaun region, Uttrakhand**



Source: Google image

**Fig.11.6 Ganga river flood, Uttrakhand**



Source: Google image

**4. Drought:** Drought is a very deadly natural Hazard because it is closely related to one of the three things (water, air, and food) necessary for the existence of any kind of life form (water) directly and the other (food) indirectly, because crops, plants and other food grains, animals etc. are completely dependent on water. This natural calamity causes great damage to agriculture and natural vegetation and creates a situation of famine. Therefore, drought is a natural disaster that occurs due to lack of rainfall for a long time. It causes a huge decline in water resources, soil moisture, and agricultural productivity. Drought can be a continuous or seasonal phenomenon and can be the result of climate change. It is considered to be a situation arising due to imbalance of climate or weather, in which an area does not receive the required amount of rainfall and this creates water crisis. According to the Indian Meteorological Department (IMD), the condition is called drought when the actual rainfall in an area is less than 75% of the normal rainfall. IMD has divided drought into two categories. Severe drought conditions occur when rainfall deficit exceeds 50% of normal rainfall, and moderate drought conditions occur when rainfall deficit is between 25 and 50% of normal rainfall.

Finally, it is clear that long-term drought caused by lack of rainfall becomes an outbreak or disaster which affects all life forms of the biosphere ecosystem, because animals and plants including humans depend on water. Even a slight decrease in water supply adversely affects everyone; hence the following negative effects are reflected in long-term drought. Such as loss of life (famine, starvation, malnutrition, heat-stroke, hypothermia), economic impacts (reduced energy production, forest fires), environmental impacts (habitat destruction, loss of biodiversity), genetic impacts (population reduction, migration) etc. Historically, Uttarakhand has experienced many droughts due to various climatic conditions. Mainly because the state is a hilly region, the availability of water here is directly related to monsoon and mountain water sources. Drought not only affects agriculture, but it also has a bad effect on water scarcity, vegetation and life. The main reasons for drought in Uttarakhand include less rainfall, drying up of water sources and climate change. The following are the major drought events in Uttarakhand:

**1970 Drought:** Uttarakhand faced a major drought in the year 1970. This drought caused food shortage for farmers and food availability became a serious problem for them. The effect of this drought forced people to migrate from hilly villages, as many people started moving to other places in search of employment.

**2008 Drought:** Uttarakhand faced severe drought in the year 2008. This year the state received less monsoon rains, due to which the water level of water sources and rivers decreased. Water crisis arose especially in Kumaun and Garhwal regions. Agricultural productivity was also greatly affected due to this drought.



**Fig.11.7 Drought condition in Kumaun Region, Uttrakhand**



Source: Google image

**Fig.11.7 Drought in Uttrakhand**



Source: Google image



**2009 Drought:** In the year 2009, there was a major drought in Uttarakhand, which severely affected the agriculture and water supply of the state. Due to this drought, there was a huge drop in the water level in many districts of Uttarakhand, causing a drinking water crisis. Due to severe shortage of agricultural products and water crisis, an emergency situation arose in many parts of Uttarakhand.

**2016 Drought:** Uttarakhand also faced drought in the year 2016, but this drought was less severe than that of 2009. During this period also there was a decrease in water sources, due to which the farmers of the state had to face a lot of crisis.

**Drought of 2020-2021:** Drought was also seen in Uttarakhand in the year 2020 and 2021. There was less rainfall especially in the hilly and high altitude areas of Uttarakhand, due to which the level of reservoirs fell. This created a situation of drinking water crisis. Problems increased at the local level.

**5. Avalanches:** Avalanche is a dangerous and unpredictable natural phenomenon in which snow, ice rocks, debris and other material fall rapidly down a slope. It is a type of snow collapse, which usually occurs in mountainous areas. Avalanche is caused by the sudden break-up and collapse of the snow layer. In this event, a large amount of snow or ice-related material slides down the slope, and it can spread for several kilometers. This occurs due to various reasons such as unbalanced snow cover, weather changes and other natural causes. This natural hazard can pose significant risks to life and property, often with devastating consequences.

**Fig.11.9 Avalanche in Garhwal Region, Uttarakhand**



Source: Google image

**Fig.11.10** Avalanche in Uttrakhand

**Source:** Google image

**1997 Badrinath Avalanche:** In the year 1997, due to heavy snowfall, high air pressure and continuous snowfall, a major avalanche in the Badrinath area caused a lot of devastation. In this incident, not only the mountain roads were blocked, but many travelers also lost their lives.

**2013 Chamoli Avalanche:** During the flood and disaster in Uttrakhand in the year 2013, many avalanches also occurred in Chamoli district. These avalanches disrupted the regional communication network and many villages were cut off from other areas. At this time, due to heavy rain and snowfall, the snow piles suddenly broke and fell down.

**2015 Yamunotri Avalanche:** In the year 2015, a major avalanche occurred in the Yamunotri area due to snowfall and strong winds, in which the road was blocked and travelers had to face trouble. **2021 Mana Pass Avalanche:** In the year 2021, an avalanche occurred in the Mana Pass region of Uttrakhand, killing Indian Army personnel. The incident was particularly worrying as the Mana Pass is located close to the border and the area is important for the army. Several soldiers were trapped and killed in this avalanche.

**2021 Nanda Devi Region Avalanche:** In the year 2021, another major avalanche occurred in the Nanda Devi region of Uttrakhand during heavy snowfall, strong winds and mountaineering, killing several climbers. The avalanche occurred on a famous trekking route and also killed some foreign tourists. The incident is particularly important as the region is a major travel destination for tourists.

### **11.3.1 DISASTER PREPAREDNESS AND MITIGATION STRATEGIES**

---

Disasters are natural or man-made events that cause severe damage to human life, property and the environment. Two important strategies are required to deal with these disasters: disaster management and disaster mitigation strategies, both of which aim to reduce disaster losses, save lives and provide better conditions for reconstruction. Disaster management is a multi-disciplinary approach. It is a strategy to deal with the pre-disaster and post-disaster effects of disasters in a region / country.

#### **11.3.1.1 Disaster Preparedness:**

Disaster preparedness generally means to arrange the necessary measures and plans to deal with any natural or man-made disasters in an area and human community before they occur. The purpose of which is to ensure the safety of life, property and resources, so that there is minimum loss in the time of disaster and relief can be provided on time. The following aspects are included in disaster preparedness

**Disaster Risk Assessment:** First of all, it is necessary to understand what kind of disasters can occur in that area. And after studying the vulnerability of the human community in the concerned area, such as flood, earthquake, storm, or epidemic, etc., the possible damage caused by these disasters has to be assessed.

**Disaster Response Plans:** Preparing disaster coping plans in homes, schools, hospitals and government offices. To inform every family and community about what should be done during a disaster, to clarify the roles and responsibilities of officers and employees in case of a disaster.

**Disaster Rescue and Rehabilitation Teams:** The rehabilitation process includes renovation of damaged and destroyed systems (water supply, electricity, communication and transport), reconstruction of destroyed houses, buildings, roads, bridges, railway lines and other useful facilities, relief employment etc. Apart from this, training local disaster relief teams and equipping them with necessary equipment. Preparing pre-defined guidelines for rescue teams and being prepared for quick action in case of disaster.

**Communication Systems:** Use of systems like radio, telephone, wireless and internet for effective communication during disaster, preparation of emergency contact list to maintain contact with the affected people, etc.

**Public Education and Training:** Disaster education plays an important role in disaster reduction and management. The main objective of disaster education is to provide information to people about the nature, type, consequences, intensity and extent of damage of outbreaks and disasters, forecasting, warning systems, safety measures and actions to be taken for adjustment so that the local community can be minimally affected by disaster effects.

**Emergency Resources:** Emergency Resources: Storage of emergency resources such as food supplies, clean drinking water, medicines, tents, generators, communication equipment, wood, coal and other essential items for immediate relief during a disaster. Ensuring availability of emergency equipment and supplies locally.

### 11.3.1.2. Disaster Mitigation

Disaster Mitigation includes efforts to save human lives as well as their property. Thus, the main objective of disaster Mitigation is to reduce the economic loss in case of disasters. The form of disaster Mitigation depends on the nature of the disaster and the environmental conditions of the area affected by the disaster. For example, in case of an earthquake, the surface structure of a particular area, man-made infrastructure (building material, density of buildings), population density etc. are important. In case of a flood, surface features are more important.

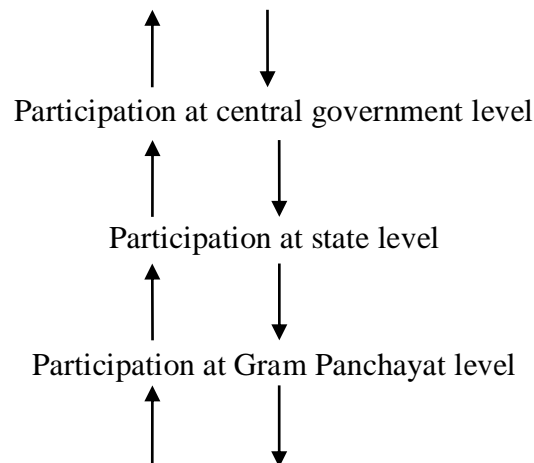
**Prediction and Early Warning Systems:** The Meteorological Department, Seismological Center, and other specialized institutions provide advance information about potential disasters, such as hurricanes, floods, or earthquakes. Develop real-time warning systems so that people can reach safe places in time.

**Community Education:** Making the community aware about disaster management and safety measures. Prepare people to face disasters through training programs.

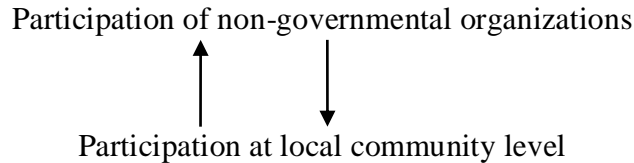
**Community Participation in Disaster Preparedness and Mitigation:** Active participation of the community in disaster management is extremely important. The capacity to deal with disasters can be increased through awareness, training and self-help groups in the community.

**Community-Based Bottom-Up Approach:** Preparing disaster response plans at the local level, so that the community can deal with the disaster itself. Forming and training local emergency service teams.

Participation at global community level







**Building Codes and Standards:** Implement strong building construction standards for protection against earthquakes, floods, and other disasters. Repair and rebuild old buildings and structures to make them safe.

**Climate Change Adaptation:** Plan measures to avoid disasters caused by climate change such as droughts, floods, and cyclones. Construct water conservation, water recharge, and reservoirs.

**Conservation of Natural Resources:** Use and conserve water, energy and agricultural resources judiciously. Adopt sustainable development measures to reduce environmental damage.

**Disaster-Proof Infrastructure:** Building disaster-resilient infrastructure not only reduces the impact of natural disasters but also helps save lives and restore normalcy quickly in times of crisis. Disaster-resilient infrastructure enhances the overall resilience of a society and ensures protection against future disasters. Building disaster-resilient infrastructure not only reduces the impact of natural disasters but also helps save lives and quickly restore normalcy in times of crisis. Disaster-resilient infrastructure enhances the overall resilience of a society and ensures protection against future disasters. Disaster-resilient infrastructure mainly includes building strong drainage systems, earthquake-resistant buildings and strong roads, building civic amenities (such as hospitals, schools) to ensure efficiency during disasters.

**Natural Resource Management:** Explain the importance of management and conservation of natural resources to the local community; motivate the community to conserve biodiversity and ecosystem. Natural resource management not only conserves natural resources, but it also plays an important role in preventing disasters and reducing their effects. Proper management of water can reduce the impact of disasters like floods and droughts. Conservation of water sources, water recycling and rainwater harvesting can increase the availability of water, which can avoid situations like drought and water crisis. Proper management of forests can help prevent natural disasters like land erosion, floods and landslides. Apart from this, forest areas also reduce the effects of climate change by controlling carbon emissions. Proper use and conservation of land can reduce disasters like drought, floods and landslides. Measures to prevent soil erosion such as tree plantation, construction of canals and other conservation methods can reduce the impact of natural disasters. Natural resource management is a major measure to deal with the effects of climate change. Better management of agriculture, water, forests and land can help us cope with disasters such as droughts, floods and heat waves caused by climate change.

## ***11.4 SUMMARY***

---

Uttarakhand is one of the most disaster-prone regions due to its diverse geographical and climatic conditions. The state is frequently affected by various natural disasters including floods, earthquakes, droughts and landslides. Over the years, climate change has had a profound impact on the pattern of natural disasters globally, including in Uttarakhand. The losses caused by natural disasters in Uttarakhand are extensive and multi-dimensional, affecting the economy, society and the environment.

Geological and climate-induced hazards are ubiquitous phenomena occurring in Uttarakhand. These hazards are directly linked to the unique natural physical features of the state, climatic events such as cloudbursts and storms that cause flash floods, and anthropogenic impacts of human activities such as developmental infrastructure like road construction, hydropower plants, settlements and agricultural activities. The disaster is followed by widespread devastation, loss of life and property and developmental disruptions, but recovery from economic and livelihood disruptions takes years. Both direct and indirect economic impacts at the community level are significant. Direct economic impacts include the loss of physical assets such as homes and damaged infrastructure for information and communication technology (ICT), transportation, agriculture, and energy. Alternatively, indirect economic impacts include loss of utilities as a result of direct impacts such as the inability to travel to places of employment and supply chain disruptions. Addressing these losses requires comprehensive disaster management strategies that include risk reduction, preparedness and response, and recovery efforts. By increasing resilience and investing in preventive measures, the impacts of natural disasters in Uttarakhand can be reduced and efforts can be made to support long-term recovery and development. Climate induced risks are a serious challenge that is affecting globally. Understanding their impacts and managing them is essential not only for the present but also for future generations. Through appropriate policies and community engagement, we can address these risks and move toward a more sustainable and secure future.

## ***11.5 GLOSSARY***

---

**Anthropogenic Impacts:** The term "anthropogenic" refers to an effect or phenomenon that is caused by human activities. For example, when changes occur in the environment due to overexploitation of natural resources, industrialization, or urbanization, they are called "anthropogenic effects."

**Drought:** Drought is a natural disaster in which there is a lack of rainfall in an area for a long period of time, causing a severe shortage of water in water sources, fields and crops. The availability of water becomes so low that it has a negative impact on life and the environment.

**Earthquake:** Earthquake is a natural disaster that occurs in the form of sudden vibrations or tremors on the surface of the earth. It occurs when the energy stored in the inner layers of the earth is suddenly released, causing the crust to shake. This process is called "seismic waves". Earthquake can also cause cracks in the earth's surface, landslides and other natural disasters.

**Flood:** In simple terms, flood is a situation when water spreads over land or areas, causing loss of life and property and other problems.

**Hazards:** Hazards are natural or man-made events that pose a threat to life, property, and the environment. These events can occur suddenly and their impact can be immediate, causing massive losses. Disasters are generally divided into two major categories: natural disasters and man-made disasters.

**Landslide:** A landslide is a natural disaster in which soil, rock, and other debris material slides downhill due to rainfall or other reasons in mountains or hilly areas. This can cause major damage, such as breaking of roads, washing away of houses or loss of life.

**Climate-induced hazards:** Climate-induced hazards are events that occur due to climate change and cause threats to life and resources in various regions. Such as increased floods, droughts, storms, cyclones, etc

---

## ***11.6 ANSWER TO CHECK YOUR PROGRESS***

---

1. Landslide is which type of disaster?

- (A) Geological disaster
- (B) Climatic disaster
- (C) Biological disaster
- (D) Man-made disaster

Answer: (A)

2. Drought is mainly related to?

- (A) Snowfall
- (B) Climate change and less rainfall
- (C) Excessive rainfall
- (D) Leakage of gases inside the earth

Answer: (B)



3. Which measure can be taken to improve water supply in drought affected area?

- (A) Water recycling
- (B) Construction of reservoirs
- (C) Rain water harvesting
- (D) All the measures are correct

Answer: (D)

4. What can be done to reduce the risk of landslides?

- (A) Rapid construction
- (B) Planting trees
- (C) Mining of sand in rivers
- (D) Construction of reservoirs

Answer: (B)

5. Which measure is most effective for disaster risk reduction?

- (A) Quick response only
- (B) Relief work only
- (C) Prior preparation and awareness
- (D) Planning without prior preparation

Answer: (c)

6. Which scale is used to measure the intensity of an earthquake?

- (a) Mercali scale
- (b) Seismograph scale
- (c) Richter scale
- (d) Both (a) and (b)

Answer: (c)

## 11.7 REFERENCES

---

- <https://www.mdpi.com/books/reprint/9366-geological-hazards-and-risk-management>.
  - <https://www.eolss.net/Sample-Chapters/C12/E1-07-01-04.pdf>.
  - <https://nios.ac.in/media/documents/316-New/Book-1/Ch-13.pdf>.
  - Microsoft Word - Concept Note DRI Workshop 20092024.docx.
  - [https://link.springer.com/chapter/10.1007/978-981-97-2100-9\\_19](https://link.springer.com/chapter/10.1007/978-981-97-2100-9_19).
  - <https://link.springer.com/article/10.1007/s11069-023-06287-1>.
  - [https://ndma.gov.in/sites/default/files/PDF/Reports/Detailed\\_report\\_UK\\_Disaster.pdf](https://ndma.gov.in/sites/default/files/PDF/Reports/Detailed_report_UK_Disaster.pdf).
  - <https://www.hindustantimes.com/dehradun/74-000ha-agri-land-in-uttarakhand-hills-drought-hit/story-vyGWuOul6IeTfQG4SALdK.html>.
  - <https://www.britannica.com/science/avalanche>.
- 

## 11.8 TERMINAL QUESTIONS

---

### (A) Long Question

1. What do you understand by disasters? Describe in detail any two natural disasters that occurred in Uttarakhand?
2. Detailed Explain in the major meteorological disasters occurring in Uttarakhand?
3. Detailed Explain in the major earthquakes occurring in Uttarakhand?
4. Explain effective disaster preparedness and mitigation strategies to reduce the impact of natural disasters?

### (B) Short Question

1. What steps are taken for pre-disaster preparedness in Uttarakhand?
2. What are the key aspects of post-disaster reconstruction work in Uttarakhand?
3. Explain in brief how local communities can be trained to be prepared for disasters in Uttarakhand?

### (C) MCQs

1. Which is the major disaster caused by heavy rains during monsoon?
  - (a) Drought
  - (b) Storm

- (c) Flood
- (d) Landslide

Answer: (c)

2. In which type of area is the possibility of landslides mostly found?

- (a) Desert
- (b) Mountainous region
- (c) Plains
- (d) Beach

Answer: (b)

3. In India, the maximum intensity of earthquakes is observed in which region?

- (a) Central India
- (b) South India
- (c) North-Eastern India
- (d) Himalayan region

Answer: (d)

4. during which natural calamity, the ground water level may decrease?

- (a) Hurricane
- (b) Flood
- (c) Drought
- (d) Earthquake

Answer: (c)

5. What is meant by "disaster preparedness"?

- (a) Increasing the damage caused by a disaster
- (b) Immediate relief work during a disaster
- (c) Reconstruction after a disaster

(d) Taking all possible measures before a disaster strikes

Answer: (d)

6. Which is known as "Disaster Warning"?

(a) Reconstruction work after disaster

(b) Relief work during disaster

(c) Alerting people before a disaster occurs

(d) Inspection of hospitals before a disaster

Answer: (c)

7. Disaster preparedness training is important for whom?

(a) All government employees

(b) Only people in disaster affected areas

(c) Only medical professionals

(d) All citizens and communities

Answer: (d)

---

**UNIT-12:            EMERGING            TRENDS            AND  
OPPORTUNITIES IN UTTARAKHAND**

---

***12.1 OBJECTIVES***

***12.2 INTRODUCTION***

***12.3 EMERGING TRENDS AND OPPORTUNITIES IN  
UTTARAKHAND***

***12.4 SUMMARY***

***12.5 GLOSSARY***

***12.6 ANSWERS TO CHECK YOUR PROGRESS***

***12.7 REFERENCES***

***12.8 TERMINAL QUESTIONS***

---

## ***12.1 OBJECTIVES***

---

- Learners will be able to identify the emerging sectors contributing to Uttarakhand's economic growth.
  - Learners will be able to understand the role of renewable energy, particularly solar and hydro power, in the state's development.
  - Learners will be able to assess the potential of tourism, including adventure, medical, and spiritual tourism, in Uttarakhand.
  - Evaluate the scope for agricultural development and floriculture in Uttarakhand.
- 

## ***12.2 INTRODUCTION***

---

Uttarakhand, a scenic state in northern India, has been undergoing rapid development in recent years. Known for its rich natural resources, including abundant water bodies, forests, and biodiversity, the state is transitioning into an economic hub while balancing its ecological and cultural significance. Here, we explore the key emerging trends and opportunities in various sectors that are shaping Uttarakhand's future.

---

## ***12.3 EMERGING TRENDS AND OPPORTUNITIES IN UTTARAKHAND***

---

Trends refer to the general direction in which something is developing or changing over time. It could be related to various fields such as technology, economy, fashion, or public opinion.

Simple words: A trend is a popular direction or change that people follow or that grows with time. Opportunities are favourable situations or circumstances that make it possible to do something, particularly to advance or succeed. Or in simple words: An opportunity is a good chance to do something or take advantage of a situation.

Trends and Opportunities in Uttarakhand:

Trends in Uttarakhand could refer to changing patterns in tourism, economic growth, environmental conservation, and infrastructure development.

Opportunities in Uttarakhand would indicate areas where growth is possible, such as eco-tourism, renewable energy, education, agriculture, or technological advancements.

In short, Trends highlight what is becoming more important or popular.

Opportunities showcase areas where there is potential for growth, success, or improvement.

---

### **1. Start an Online Tourism Business**

Starting an online tourism business in Uttarakhand is highly promising, as the state's tourism industry thrives on its appeal to adventure enthusiasts and nature lovers

### **2. Opt. for a Real Estate Business**

The real estate sector in Uttarakhand is experiencing significant growth, making it an excellent opportunity for aspiring entrepreneurs. With increasing demand for residential, commercial, and holiday properties in the state, starting a real estate business can be a highly profitable venture.

### **3. Start an Online Bakery**

If you are passionate about baking but lack physical space for a traditional bakery, starting an online bakery store is a great option. With limited investment, you can focus on selling specific items and customized creations, such as cakes, cookies, bread, mini pizzas, smoothies, waffles, and more, catering to customers conveniently through online platforms.

### **4. Get into At-Home Photography Business**

If you are passionate about nature photography, you can capture stunning images of Uttarakhand's picturesque mountains and landscapes. These photographs can be sold to online stock photography platforms, allowing you to turn your hobby into a source of income from the comfort of your home.

### **5. Start Fish Farming**

Fish farming plays a significant role in Uttarakhand's economy, making it a promising business opportunity. By studying the market and learning about commercial fish farming, you can invest in this profitable venture. Target species such as Trout, Mulley, Rohu, Butchwa, Carp, and the Monstrous Goonch to cater to local and commercial demands effectively



**Fig12.1: Fish Farming in Uttarakhand**

Source: Google

### 6. Become a Tourist Guide

Uttarakhand, famously called Devbhumi, is a renowned destination for Hindu pilgrims and tourists. If you enjoy traveling and have a knack for guiding others, starting a career as a tourist guide can be a rewarding and profitable venture.

### 7. Open an Eatery

Uttarakhand's popular hill stations, including Dehradun, Nainital, Ranikhet, Mussoorie, and Dhanaulti, attract numerous tourists. Opening an eatery that serves local or specialty food in these areas can be a profitable business opportunity, catering to the diverse tastes of visitors.

### 8. Dairy Farming

Dairy farming is a promising business in Uttarakhand due to its favorable climate and natural grazing areas. The state's clean environment and abundance of fodder make it ideal for raising healthy livestock, particularly cows and buffaloes. Dairy farming provides opportunities to produce high-quality milk and dairy products, which can be supplied locally and beyond. This business has significant potential, benefiting from Uttarakhand's growing demand for fresh and organic dairy items.

**Fig10.2: Dairy Farming in Uttarakhand**

**Source: Google**

### **9. Sell Handicrafts of Uttarakhand**

Uttarakhand is rich in traditional handicrafts that reflect its cultural heritage and local craftsmanship. The state is known for unique products such as woollen garments, wood carvings, brass and copper items, and pottery, which have a strong market demand both locally and nationally. Starting a handicraft business in Uttarakhand can be a profitable venture for artisans or craftsmen, offering numerous opportunities for growth with low initial investment.

- **Leverage Local Craftsmanship:** Uttarakhand's artisans are skilled in producing handwoven woollen textiles, wooden carvings, and stone carvings, which are popular among tourists and art collectors. By promoting these traditional arts, you can create a unique product line that reflects the rich culture of the region.
- **Tourism-Driven Demand:** With a high influx of tourists to hill stations and pilgrimage sites in Uttarakhand, there's a steady demand for locally crafted souvenirs. This creates an ideal opportunity for selling handicrafts like traditional jewellery, textiles, and home decor items.

- **Online Presence:** By setting up an online store, you can cater to a global audience. Handicrafts from Uttarakhand have a niche market in international markets, especially for people looking for authentic, handmade items. Platforms like Etsy, Amazon, and other e-commerce websites can help you reach customers worldwide.
- **Promote Eco-Friendly Products:** There is increasing demand for eco-friendly and sustainable products and handicrafts in Uttarakhand are often made using natural materials. This can appeal to environmentally conscious consumers.
- **Support from Government and NGOs:** The government of Uttarakhand and various NGOs often run programs to support the handicraft sector. You can benefit from financial support, training, and marketing initiatives to expand your business.
- **Customization and Personalization:** Offering customized products, such as personalized jewelry or embroidered textiles, can help cater to a niche market and increase the value of your offerings.
- **Workshops and Training:** Organizing workshops for tourists or local communities to learn the art of handicrafts can generate additional income, along with building brand awareness.
- **Collaborations with Local Artisans:** Collaborating with local artisans for production and design can increase the scale of your business while helping promote traditional craftsmanship.

**Fig12.3: Handicraft of Uttarakhand**



**Source: Google**



Starting a handicraft business in Uttarakhand is a fantastic way to tap into the growing market for unique, handmade products while supporting the region's artisan community and preserving its cultural heritage.

### 10. Provide Car Rental Service

Car rental services are available across Uttarakhand. Several companies have their fleets to offer rental cars to tourists who wish to explore the state at their leisure.

### 11. Open a Souvenir Shop

Opening a souvenir shop in Uttarakhand is a great business opportunity, given the state's reputation as a top tourist destination. Tourists visiting popular hill stations, pilgrimage sites, and adventure spots often look for mementos to remember their trip. By setting up a souvenir shop, you can sell local handicrafts, religious items, fruit preserves, woollen clothes, and other unique products that reflect the culture and heritage of the region. These items have high demand among visitors who want to take home a piece of Uttarakhand. With a well-placed shop in key tourist areas like Dehradun, Nainital, or Haridwar, you can attract a steady flow of customers and earn a decent income from both religious goods and locally produced specialties.

**Fig12.4: Souvenir of Uttarakhand**



Source: Google

## 12. Start a Homestay Business

Starting a homestay business in Uttarakhand offers a promising opportunity, especially given the state's popularity as a tourist destination. Homestays are increasingly favoured by travellers seeking a more personalized, budget-friendly alternative to hotels or guesthouses. They offer guests the chance to experience local culture, cuisine, and hospitality in a more intimate setting. Uttarakhand, with its hill stations, religious sites, and adventure tourism hotspots, attracts a steady stream of visitors throughout the year. A homestay business in areas like Nainital, Mussoorie, or Rishikesh can be a lucrative venture, providing affordable accommodations to tourists while also offering a chance to showcase the region's natural beauty and traditions. By offering homely comforts and local experiences, you can cater to budget-conscious travellers and create a unique, memorable stay.

**Fig12.5: Souvenir of Uttarakhand**



Source: Google

## 13. Establish a Computer Training Institute

Establishing a computer training institute in Uttarakhand can be a profitable venture, especially as the demand for tech skills continues to rise. With increasing reliance on digital platforms for business, education, and daily life, there is a growing need for computer education across all age groups. By starting a computer training institute, you can offer courses on basic computer literacy, office software, graphic design, programming, web development, and more. Targeting students, working professionals, and even senior citizens who wish to enhance their digital skills can create a steady clientele. Given the state's

expanding urban areas and increasing internet penetration, this venture has the potential to cater to a diverse market, ensuring long-term growth and success.

**Fig12.6: Computer Training Institute**



**Source: Google**

#### **14. Start a Food Truck Business**

Starting a food truck business in Uttarakhand can be a unique and lucrative opportunity, especially for those who don't have the resources for a permanent commercial space. With a food truck, you can bring your culinary creations to popular tourist destinations, hill stations, and events. This mobile business model allows you to serve local cuisine, such as Aaloo Ke Gutke, Kafuli, Phaanu, Rabri, and other traditional Garhwal dishes, to both tourists and locals. You can also participate in food festivals or private events, expanding your reach and customer base. With minimal upfront investment compared to a fixed restaurant, this business can be highly flexible and profitable, especially given the state's thriving tourism industry.



**Fig12.7: Food Truck**

Source: Google

### 15. Offer Automotive Repair Services

Vehicles can break down at any point, especially while traversing hilly areas. You can choose to serve vehicle owners by providing them with automotive repair services. If you are starting from scratch, you will need finances, equipment, manpower, and skills to run an automotive repair service business successfully. To stand out, offer at-home car repair services along with a towing service.

Starting an automotive repair service in Uttarakhand presents a great business opportunity due to the state's rugged terrain and heavy tourist traffic. Vehicles frequently break down in the hilly areas, creating a constant demand for repair services.

Key opportunities include:

- a. High Demand: Tourists and locals alike need reliable vehicle repair services, especially in popular destinations like Nainital, Mussoorie, and Rishikesh.
- b. At-Home Services: Offering mobile or at-home car repair services can be an added convenience for customers.
- c. Towing Services: Providing roadside assistance and towing for vehicles stuck in remote areas adds value to your offerings.
- d. Specialized Services: Tailor services for tourist vehicles, which may require more frequent repairs.
- e. 24/7 Emergency Services: Offering round-the-clock assistance for urgent breakdowns can attract more customers.



- f. **Eco-Friendly Solutions:** Using sustainable practices aligns with Uttarakhand's focus on environmental conservation.

By focusing on these services, you can cater to both local and tourist vehicle owners, ensuring a steady stream of business.

### **Open a Religious Goods Store in Uttarakhand**

Uttarakhand, known as "Devbhumi" (Land of the Gods), is a prominent pilgrimage destination, attracting thousands of religious tourists annually. Establishing a religious goods store in the state is a lucrative business opportunity, catering to both the spiritual needs of visitors and the local community. The demand for religious supplies is consistently high, especially in towns and cities near pilgrimage sites like Haridwar, Rishikesh, Kedarnath, and Badrinath.

Key Advantages and Opportunities:

- a. **High Demand from Pilgrims:** With Uttarakhand being home to several famous temples and pilgrimage sites, religious tourists constantly seek items such as holy books, pooja utensils, incense sticks, prayer beads, and statues. A store selling these items will have a steady stream of customers, particularly during peak pilgrimage seasons.
- b. **Diverse Product Range:** You can offer a wide range of spiritual and religious products, including:
  - **Holy Books:** Religious texts like the Bhagavad Gita, Ramayana, or other scriptures in various languages.
  - **Prayer Beads (Mala):** Used for meditation and prayer, a popular item for devotees.
  - **Pooja Utensils:** Items for performing religious rituals, such as incense holders, diya (lamps), bells, and thalis.
  - **Statues and Idols:** Statues of gods and goddesses, which are essential for homes and temples.
  - **Religious Clothing:** Items like dhotis, saris, or shawls, worn during religious rituals.
  - **Religious Gifts:** Offering small tokens or souvenirs such as framed photos of deities or holy water containers.
- c. **Online Store Expansion:** Besides a physical store in pilgrimage destinations, you can also establish an online presence. Offering home delivery services for religious goods,

especially during festival seasons, can cater to a wider market. Online platforms can help expand your reach to customers beyond Uttarakhand, including those who want to purchase religious items for personal use or as gifts.

- d. **Cultural Significance:** The religious items sold in these stores hold great cultural and spiritual significance for Hindus and devotees from different faiths. Offering high-quality, authentic products can help build trust with your customer base, leading to repeat business.
- e. **Seasonal Business:** While the business is steady throughout the year, peak tourist seasons—such as during the Char Dham Yatra, Kumbh Mela, or festivals like Diwali and Navratri—can significantly increase sales.
- f. **Support Local Artisans:** Many of the religious goods in Uttarakhand are handmade, including brass, copper, and wooden items. You can collaborate with local artisans to source unique and high-quality products, helping to promote traditional crafts while ensuring the authenticity of your store's offerings.
- g. **Low Overhead Costs:** If you open the store in an established pilgrimage area, you can benefit from an existing customer base, reducing the need for significant marketing investments. Simple storefronts in prime locations can be cost-effective for the initial setup.
- h. **Promotional Activities:** Partnering with temples or local religious events for sponsorships or sales booths can help raise awareness and attract customers. Additionally, offering discounts or packages during religious festivals can boost sales.

Opening a religious goods store in Uttarakhand not only taps into a growing market of spiritual tourists but also provides an opportunity to engage with the state's rich cultural and spiritual heritage. With the right products, strategic location, and effective marketing, such a business can thrive year-round.

## **16. Tourism and Ecotourism**

Tourism has been the backbone of Uttarakhand's economy, but recent trends show a shift towards sustainable and ecotourism, driven by the increasing global focus on environmental conservation. Key opportunities include:

**Eco-Friendly Tourism Infrastructure:** There is a growing demand for eco-resorts, homestays, and offbeat trekking routes. Building sustainable infrastructure that minimizes environmental degradation while promoting local culture and heritage is a major opportunity.

Adventure Tourism: With its mountainous terrain, Uttarakhand is ideal for adventure sports like trekking, mountaineering, paragliding, rafting, and skiing. The government and private players are investing in improving adventure tourism facilities, creating opportunities for businesses catering to adventure seekers.

**Fig12.8: Adventure-Tourism**



Source: Google

Spiritual and Wellness Tourism: Rishikesh and Haridwar are globally recognized for yoga and spiritual tourism. With increasing awareness around mental and physical wellness, yoga retreats, meditation centers, and Ayurvedic wellness resorts are experiencing heightened demand.

**Fig12.9: Adventure-Tourism**



Source: Google

**Astro-tourism in Uttarakhand:**

Astro-tourism refers to travel experiences centered around viewing celestial events, stargazing, and exploring astronomy. It typically involves visiting places where light pollution is low, offering clear night skies for astronomical observations.

Starscapes and the Uttarakhand Tourism Development Board have partnered to launch "Nakshatra Sabha," an astro-tourism initiative in Mussoorie, with plans to extend it to Uttarkashi, Pithoragarh, Nainital, and Chamoli. The project focuses on preserving dark skies, stimulating local economies, and providing training opportunities for the community.

**Fig12.10: Astro-Tourism**



**Source: Google**

**Why Uttarakhand is Ideal for Astro-tourism**

Uttarakhand, with its pristine natural beauty and high-altitude locations, offers some of the best conditions for astro-tourism. Here's why:

- a. **Clear Skies and High Altitudes:** Places like Auli, Chakrata, Munsiyari, and the hills around Nainital are known for clear skies and minimal light pollution, perfect for stargazing.

**Fig12.11: Astro-Tourism**

**Source: Google**

- b. **Low Light Pollution:** Remote areas in Uttarakhand have very low levels of artificial lighting, making it easier to view stars, planets, and other celestial phenomena.
- c. **Accessibility to Natural Observatories:** The high-altitude Himalayan regions serve as natural observatories where amateur astronomers and tourists can enjoy activities like meteor shower watching, star trails, and planetary sightings.
- d. **Spiritual Tourism Tie-in:** The state is already popular for spiritual tourism. Combining astro-tourism with spiritual journeys can offer travellers a unique experience of connecting with nature and the cosmos.

#### **Opportunities in Astro-tourism in Uttarakhand:**

- a. **Setting up Astro-Camps:** Entrepreneurs can organize camps that offer professional telescopes, guided stargazing sessions, and workshops on astronomy for tourists.
- b. **Eco-friendly Resorts:** Building eco-resorts or observatories with astro-tourism as the focal point can attract tourists looking for sustainable and unique travel experiences.
- c. **Educational Tours:** Schools and universities could collaborate with local agencies to conduct astronomy-themed educational tours, capitalizing on the perfect viewing conditions.
- d. **Astro-Festivals:** Organizing annual astro-festivals where people gather for stargazing, astrophotography competitions, or lectures on celestial events could boost local tourism.

#### **Prominent Astro-Tourism Spots in Uttarakhand:**

- i. **Binsar:** Famous for clear skies and great stargazing conditions.
- ii. **Chopta:** Known for its scenic beauty and high-altitude stargazing.
- iii. **Kausani:** Offers a panoramic view of the night sky and the Himalayas.



## 17. Agriculture and Agritech

Agriculture remains a key sector in Uttarakhand, but there are notable shifts in this field due to technological advancements:

**Organic Farming:** The state has great potential to become a hub for organic farming. The demand for organic fruits, vegetables, and herbal products is increasing. Government initiatives and subsidies for organic certification provide a significant opportunity for small and medium farmers.

**Fig12.12: Organic Farming**



**Source: Google**

The trend of organic farming is on a boom in the market. There is a consistent rise in consumers' demand for organic products globally in the last one decade. People nowadays prefer to consume organic products more often, due to their reliability of not being contaminated with chemicals and helping the environment too. Many countries all over the world are switching to organic agriculture. Uttarakhand is among the several states in India that are taking steps forward in promoting organic farming.

### **Organic Farming in Uttarakhand**

Currently, the scope of Organic Farming in Uttarakhand is at its best since the farmers use the traditional approach to farming, i.e. rain-fed agriculture, without using pesticides or fertilizers. Along with the common farmers, the government is continuously taking active measures to make the state fully organic and enhance the productivity level along with this. The Uttarakhand Organic Commodity Board (UOCB), the state's nodal agency for promoting

organic farming, was established to encourage sustainable development through organic farming.

### **Organic Product grown in Uttarakhand**

The Himalayan state of Uttarakhand produces an array of certified organic products that are exported globally. There is a list of organic spices, herbs, and pulses grown in Uttarakhand. Some of them are listed below.

Glycine soja (Soyabean), Maize Corn (Mungari), Mustard (Sarson), Pigeon Pea (Tor), Kidney bean (Rajma), Ginger (Adarak), Pea (Matar), Sesame (Til), Turmeric (Haldi), Kukam powder, Onion ,Pearl millet (Junyali), Jhangora Rice(barnyard millet) ,Mandua Atta, Jakhiya Seeds

**Horticulture and Floriculture:** The unique climate of Uttarakhand makes it suitable for horticulture and floriculture. There is immense potential for cultivating high-value crops like apples, kiwi, pomegranates, and flowers, especially in regions like Nainital and Dehradun. Investments in cold storage and supply chain logistics are crucial for tapping this opportunity.

Kiwi farming in Uttarakhand is becoming a popular agricultural activity, especially in areas above 1,000 meters in altitude. Here's some information about kiwi farming in Uttarakhand:

Today, the orchard has around 400 kiwi trees, with a mix of four varieties – Havard, Alison, Bruno, and Monty. Currently, 520 farmers from eight villages – Shama, Badi Paniyali, Liti, Hampti-Kapdi, Ramadi, Bhanar, Naukudi, and Malkadhungracha – in the Shama cluster are associated with the growth centre.

**Fig12.13: Organic Farming**



Source: Google



Floriculture in Uttarakhand is a growing sector that includes flower cultivation, entrepreneurship, and exports:

Different varieties of flowers can be grown in different regions of Uttarakhand, including gerbera, gladiolus, and carnation in the plains, and roses in the hills at altitudes of 2,000 to 3,000 feet. Above 3,000 feet, flowers like liliun and tulip are recommended.

**Fig12.14: Floriculture**



**Source: Google**

Agri-Tech Solutions: The adoption of AI, IoT, and machine learning in agriculture is gradually gaining traction. Precision farming technologies, weather prediction models, and automated irrigation systems can optimize crop yields and resource use. Startups focusing on AgriTech have vast opportunities to innovate in this field.

## **18. Renewable Energy**

Uttarakhand, with its unique geographical features and abundant natural resources, presents vast opportunities in the renewable energy sector. The state's topography, which includes vast rivers, high-altitude terrain, and abundant sunshine, offers an ideal environment for harnessing various forms of clean energy, making it a potential hub for renewable energy development.

Uttarakhand's abundant natural resources position it as a significant player in the renewable energy sector:

Hydropower: Uttarakhand has substantial untapped hydropower potential due to its river systems, making it an attractive location for small and medium hydropower projects. There are opportunities for public-private partnerships and foreign investments in this sector.

**Fig12.15: Hydropower**



**Source: Google**

One of Uttarakhand's key opportunities lies in hydropower generation. With numerous rivers such as the Ganga, Yamuna, and their tributaries flowing through the state, it has significant untapped hydroelectric potential. The state already generates a substantial portion of its electricity from hydro projects, but there remains scope for further development, particularly in small and micro-hydel projects, which can provide energy to remote and rural areas.

**Solar Energy:** With its mountainous regions, Uttarakhand receives a substantial amount of sunlight, making solar energy projects increasingly viable. Solar farms, rooftop solar installations, and hybrid solar-hydro projects are areas for future expansion.

**Fig12.16: Solar Energy Opportunity in Uttarakhand**



**Source: Google**

The state also has excellent potential for solar energy, with many regions receiving strong sunlight for most of the year. Solar power can be particularly useful in remote mountainous areas where extending grid infrastructure is challenging. Rooftop solar installations, as well as large-scale solar farms, are viable options for clean and sustainable energy production.

Wind Energy and Biomass: Though not as developed as hydropower, there are emerging interests in wind energy in certain hilly areas, and biomass projects using agricultural waste can be promoted in rural regions.

### **19. Information Technology (IT) and Education**

The digital transformation trend is creating new pathways for economic growth in Uttarakhand. Several areas are poised for growth:

IT and Startups: The state has seen a gradual rise in IT and tech-based startups, especially in Dehradun. With increasing internet penetration, e-commerce, digital services, and IT outsourcing opportunities are growing. Initiatives like Uttarakhand Startup Policy are fostering a startup ecosystem in the state.

E-Learning and EdTech: With a large student population, there is an opportunity for online education platforms and EdTech startups. Leveraging remote learning tools and digital platforms, the education system is integrating more technology, especially after the COVID-19 pandemic. Upskilling, vocational training, and skill development programs using digital mediums have immense scope in Uttarakhand.

### **Infrastructure Development**

The state's challenging terrain has historically made infrastructure development difficult, but modern engineering and government initiatives are changing this:

Smart Cities: Dehradun, Haridwar, and Rishikesh have been selected under India's Smart City mission. Smart infrastructure development, including smart traffic management, waste management systems, and intelligent lighting, presents ample opportunities for companies involved in urban development.

Transport Infrastructure: New highway projects, railway expansion (such as the Char Dham railway project), and air connectivity improvements are ongoing. The development of road networks to enhance connectivity to remote villages offers growth opportunities for construction companies and logistics providers.



Logistics and Warehousing: As agriculture, horticulture, and pharmaceutical sectors grow, logistics and warehousing infrastructure will become critical. Cold chain infrastructure for perishable goods and efficient transportation systems can boost the state's economy significantly.

### Trend of urbanization in Uttarakhand

The trend of urbanization in Uttarakhand has been gradually increasing, driven by factors such as economic development, migration for better employment opportunities, and improvements in infrastructure. Here are key aspects of this urbanization trend:

**Fig12.15: Urbanisation in Dehradun and Haldwani Source:**



### Google Earth Pro

- a. Population Growth in Urban Areas: Cities like Dehradun, Nainital, Haridwar, Udham Singh Nagar, and Haldwani have seen significant population growth in recent years. Many rural residents are migrating to these urban centers in search of better job prospects, educational opportunities, and healthcare facilities.
- b. Infrastructure Development: The state has made considerable improvements in infrastructure, such as better roads, transportation networks, water supply, and sanitation facilities, making urban areas more attractive for settlement and investment.
- c. Industrialization and Economic Opportunities: The expansion of industries, particularly in sectors like manufacturing, tourism, education, and services, has contributed to the growth of urban centers. These industries offer employment opportunities, which pull people from rural areas.

- d. **Real Estate Growth:** The demand for housing in urban areas has led to the growth of real estate developments, especially in cities like Dehradun. There has been a rise in residential, commercial, and mixed-use developments.
- e. **Tourism and Services Sector:** Urban centers like Dehradun and Haridwar have become hubs for tourism and services, creating economic growth and urban expansion. These areas are not only a draw for tourists but also for businesses catering to tourism-related services.
- f. **Challenges of Urbanization:** With rapid urbanization, Uttarakhand faces challenges such as strain on infrastructure, increased pollution, waste management issues, and the loss of agricultural land to urban expansion. The region's hilly terrain and ecological sensitivity also make urban planning more complex.
- g. **Government Initiatives:** The government of Uttarakhand has implemented several policies to support sustainable urban growth, including the Uttarakhand Urban Sector Development Investment Program (USDP), which aims to improve infrastructure and basic services in urban areas.

Urbanization in Uttarakhand is accelerating due to economic, infrastructural, and social changes. While it offers opportunities for growth, it also requires careful planning to mitigate its challenges and ensure sustainable development.

---

## ***12.4 SUMMARY***

---

Uttarakhand, a Himalayan state in India, is experiencing rapid growth across various sectors. Tourism, particularly eco-tourism and adventure tourism, is booming due to its natural beauty and religious significance. The state is also becoming a hub for hydropower and renewable energy, leveraging its rich water resources for clean energy projects. In agriculture, Uttarakhand is promoting organic farming and the cultivation of high-value crops, such as fruits, vegetables, and medicinal plants, with increasing domestic and international demand. The IT and education sectors are also expanding, with new IT parks and educational institutions generating employment opportunities for the youth. Additionally, infrastructure development, including improved connectivity through new roads and airports, is attracting investments in real estate and industries. With a focus on sustainable development, clean energy, tourism, and education, Uttarakhand offers significant opportunities for economic growth and job creation while preserving its natural resources.

---

## ***12.5 GLOSSARY***

---

**Adventure Tourism:** Adventure tourism involves traveling to engage in exciting and physically challenging activities, often in natural or remote environments, such as trekking, rafting, climbing, or wildlife exploration.

**Medical Tourism:** Medical tourism refers to traveling to another country or region to receive medical care, often for specialized treatments, surgeries, or wellness therapies, typically at lower costs or with advanced facilities.

**Astro-tourism:** Astro-tourism is travel focused on stargazing, observing celestial events, or visiting astronomical observatories and dark-sky reserves, offering unique experiences of the night sky.

**Solar Energy:** Solar energy is the power harnessed from the sun's rays, converted into electricity or heat using technologies like solar panels, offering a clean, renewable, and sustainable energy source.

**Hydropower:** Hydropower is renewable energy generated by harnessing the kinetic energy of flowing or falling water to produce electricity, often using dams or turbines.

**Floriculture:** Floriculture is the cultivation and management of flowering and ornamental plants for commercial use, including production for gardens, floral arrangements, and landscaping. It involves breeding, growing, and marketing flowers and plants for sale in domestic and international markets.

**Horticulture:** Horticulture is the science and art of growing fruits, vegetables, flowers, and ornamental plants. It involves the cultivation, management, and production of these plants for food, aesthetic, and medicinal purposes.

**Spiritual and Wellness Tourism:** refers to travel focused on rejuvenating the mind, body, and soul. It involves visiting destinations that offer spiritual experiences, healing practices, meditation, yoga, and wellness therapies, often aimed at improving mental and physical well-being.

---

## ***12.6 ANSWERS TO CHECK YOUR PROGRESS***

---

Do you know Astro-tourism refers to travel experiences centered around viewing celestial events, stargazing, and exploring astronomy. It typically involves visiting places where light pollution is low, offering clear night skies for astronomical observations.

---

## ***12.7 REFERENCES***

---

1. Kharkwal, S.C (2018): Uttarakhand Geo-Economic Profile, A Geographical Analysis of Physical, Cultural & Economic Scenario, Winsar Publishing Co. 8 1<sup>st</sup> Floor, K.C City Center 4 Dispensary Road Dehradun- Uttarakhand.
2. Joshi, M.D, Know Your State Uttarakhand, Complete Description of History, Culture, Politics with Growth & Prospects, Arihant Publications(I) Pvt Ltd, Meerut
3. Maithani, D.D, Prasad, Gyatri, Nautiyal, Rajesh, (2015) Geography of Uttarakhand, Sarda Pustak Bhawan Allahabad
4. <https://timesofindia.indiatimes.com/travel/travel-news/uttarakhand-tourism-launches-nakshatra-sabha-indias-first-astro-tourism-campaign/articleshow/109811672.cms>
5. <http://www.theamazinguttarakhand.com/uttarakhand-adventure-tour-packages.html>
6. <https://www.businesstoday.in/latest/trends/story/indias-first-astro-tourism-campaign-uttarakhand-tourism-announces-nakshatra-sabha-427927-2024-05-02>
7. <https://yourstory.com/2024/05/uttarakhand-nakshatra-sabha-astro-tourism-campaign>
8. <https://www.ifoam.bio/news/indian-state-uttarakhand-introduces-countrys-first>
9. <https://www.pahadilala.com/blog/organic-farming-and-its-future-in-uttarakhand?srsltid=afmbooryw-himaqikwj0w3plvemft1ux60ipvcardatuz9a4mclmoci1>
10. <https://uocb.org/>
11. <https://www.pahadilala.com/blog/organic-farming-and-its-future-in-uttarakhand?srsltid=afmbooryw-himaqikwj0w3plvemft1ux60ipvcardatuz9a4mclmoci1>
12. <https://www.agrifarming.in/organic-farming-in-uttarakhand-how-to-start>
13. <https://www.pioneeredge.in/area-under-organic-farming-increasing-in-state-uniyal/>



14. <https://timesofindia.indiatimes.com/city/dehradun/kiwi-farming-revives-agricultural-scenario-of-once-barren-villages-of-bageshwar/articleshow/110577177.cms>

15. <https://sanctuarynaturefoundation.org/article/uttarakhand%3A-existing%2C-under-construction-and-proposed-hydropower-projects>

16. <https://ureda.uk.gov.in/>

14. <https://siidcul.com/IIE-IT-Park-Dehradun>

15. <https://mydukaan.io/blog/business-ideas-in-uttarakhand/>

16. <https://www.ibef.org/states/uttarakhand>

17. <https://uusdip.org/urban-growth>

---

## **12.8 TERMINAL QUESTIONS**

---

### **(A) Long Questions**

1. What are the emerging trends and opportunities in Uttarakhand?
2. Write about the opportunities in Uttarakhand Tourism and Ecotourism Uttarakhand.

### **(B) Short Questions**

1. What is an Astor-tourism? Explain it.
2. Write on Horticulture and its scope in Uttarakhand.
3. Why is the concept of homestays becoming popular in Uttarakhand?
4. What makes fish farming a profitable business opportunity in Uttarakhand?
5. How can artisans benefit from starting a handicraft business in Uttarakhand?
6. Why is establishing a computer training institute considered a lucrative venture in Uttarakhand?
7. Write about the opportunities in Organic farming in Uttarakhand.
8. Write about the solar energy opportunities in Uttarakhand.

### **(C) MCQ's**

What makes starting an online tourism business in Uttarakhand promising?

- A) Availability of advanced technology
- B) Uttarakhand's appeal to adventure seekers and nature lovers
- C) Government subsidies for online businesses

D) High population density

2. Why is the handicraft business considered a good opportunity in Uttarakhand?

- A) Low demand for local products
- B) Rich cultural heritage and skilled artisans
- C) Lack of other business opportunities
- D) Availability of raw materials at zero cost

3. What type of accommodation is gaining popularity among tourists in Uttarakhand?

- A) Luxury resorts
- B) Home stays
- C) Bed and Breakfast establishments
- D) Dormitories

4. Which fish species is mentioned as a potential target for fish farming in Uttarakhand?

- A) Salmon
- B) Trout
- C) Tuna
- D) Shark

5. What is an advantage of establishing a computer training institute in Uttarakhand?

- A) Availability of free internet for businesses
- B) Growing demand for digital skills across diverse age groups
- C) Government funding for tech start-ups
- D) Presence of a highly skilled workforce

6. Which of following is not a kind of fish?

- A) Trout
- B) Rohu
- C) Carp
- D) Murrah

7. Which of the following city is not a part of Uttarakhand.

- A) Dehradun,
- B) Nainital,
- C) Haridwar,
- D) Kanpur

8. In which district of Uttarakhand Kausani is located?

- A) Chamoli
- B) Almora
- C) Bageshwar
- D) Pithoragarh

9. Which of the place of Uttarakhand is known for Spiritual and Wellness Tourism?

- A) Nainital
- B) Mussoorie
- C) Rishikesh
- D) Dehradun

10. Which of the following are not the examples of Renewable Energy sources?

- A) Solar Energy
- B) Wind Energy
- C) Hydropower
- D) Coal

Answer) 1.b, 2.b, 3.b, 4.b, 5.b, 6.d, 7.d, 8, 9.c, 10.d

**UNIT-13: POLICY IMPLICATIONS AND  
RECOMMENDATIONS FOR SUSTAINABLE  
DEVELOPMENT**

**13.1 OBJECTIVES**

**13.2 INTRODUCTION**

**13.3 POLICY IMPLICATIONS AND RECOMMENDATIONS FOR  
SUSTAINABLE DEVELOPMENT**

**13.4 SUMMARY**

**13.5 GLOSSARY**

**13.6. ANSWER TO CHECK YOUR PROGRESS REPORT**

**13.7 REFERENCES**

**13.8 TERMINAL QUESTION**

---

### ***13.1 OBJECTIVES***

---

- To implement future policies and plans along with fulfilling the present needs for environment and resource conservation.
- To formulate a research plan for renewable resources in place of traditional energy resources.
- Coordinate the suggestions and indigenous knowledge of all sections and local stakeholders with technology in sustainable development.
- To evaluate the works of sustainable development in Uttarakhand, and to determine the regional policy.

---

### ***13.2 INTRODUCTION***

---

Sustainable development is not just a word, but it is a concept of resource use and environmental protection that works to establish a balance between the present and future generations in which environmental, and socio-economic pillars are kept together. Sustainable development policy implications and recommendations mainly include the steps taken to fulfil the long-term objectives of natural wealth and human welfare. Sustainable development means environmental protection, social harmony and judicious use of resources along with economic strength, which remains useful for many generations. Not only the policies and resource use of the present development but also the possibilities and means of development for future generations should be kept by the demand. The concept of sustainable development is an attempt to suggest policy suggestions to correct the imbalance caused by the exploitation of resources and a multi-dimensional approach for improvement in the affected areas in coordination with stakeholders. In the policies of sustainable development, an attempt is made to see how the formulation and implementation of policies can be useful for achieving the goals of sustainable development.

To achieve the goals of sustainable development, priority is given to those policies which can maintain long-term stability. For example, in the field of energy, developing renewable resources in place of traditional energy resources, green agriculture, green urban development and maintaining traditional means for a long time, which works on the principle of a strong action plan, improving the current policy framework and increasing coordination between other departments. Sustainable development policies prove helpful in dealing with local as well as global challenges.

At present, initiatives at the global level to deal with climate change, biodiversity loss, social inequalities and natural resource crises such as the Montreal Conference, Earth Summit, Kyoto Conference, and Paris Conference are planned plans to keep developmental activities smooth with sustainable development and environmental protection. The results of this are leading to the formation of concrete action plans at global, national and regional levels and are strengthening the eco-environment, along with controlling the present unwise resource use and making the public aware of environmental crises and also developing a deep understanding of the environment and resources. In sustainable development, keeping in mind the present crises and future obstacles, the policymakers are making plans and looking for new opportunities, and inclusive, transparent and accountable rules are being formulated. Since this planning is in the global context, it also exchanges cooperation between different countries. For example, the effort being made to solve a global crisis like climate change is the strongest example of sustainable development policies. Because this planning is committed to working at the surface level, which also prepares action plans by regional needs and demands so that balance can be established at the regional level, technology and innovation are also included in traditional methods which provide more benefits at limited cost, for which apart from effective economic prosperity, financial management, measures to reduce economic inequalities are also included. The biggest feature of sustainable development is that this planning encourages partnership between private and public sectors in which work is done to bring all sections of the society into the mainstream.

In the context of Uttarakhand, it is very important to plan the values of sustainable development because being a mountainous state, there has been a long-standing demand for sustainable planning for the conservation of natural resources and their sustainable use for a long time and to establish a balance between environmental protection and economic development and for inclusive development works. While sustainable planning will conserve natural resources on the one hand, on the other hand, the mountain human communities will get protection from Himalayan disasters. Apart from this, the planned use of Himalayan resources will also be possible. Because innumerable unscientific developmental activities are being carried out in the Himalayan regions which are giving rise to many disasters every year, there is a need to formulate a planned structural development policy to prevent these disasters and for infrastructural development. So that the existence and importance of the Himalayas remain intact sustainable policies can be implemented in other regions along with the Himalayan regions and the goals set by humans can be achieved.

---

### ***13.3 POLICY IMPLICATIONS AND RECOMMENDATIONS FOR SUSTAINABLE DEVELOPMENT***

---

**Sustainable Development Meaning & Definition-** Sustainable development means such development which works to provide capabilities to meet the needs of the present as well as to preserve it for the future and to meet the demands of the new generations, whose objective is to establish a balance between environmental protection, economic development and social harmony. In definitional terms, "Sustainable development is a process in which natural resources are used in such a way that the environment is not harmed, all sections of society are benefited and these resources can be used sustainably in future as well".

**Concept of Sustainable Development-** Sustainable development is a model which provides stability to economic, social and environmental stability as well as can convert the destruction of natural resources into development. Such a development which humans can keep moving for eternity, such a development which can bring prosperity to both humans and nature. The method adopted by man for environmental management and protection of environment is called sustainable development in which human prosperity and economic development are accelerated without harming the ecosystem, which adopts the principle of development without destruction. The objective of sustainable development ensures the fulfilment of human needs in both the present and future periods in a fundamental form without any natural degradation.

It is well known that many types of inequalities have arisen due to the implementation of pre-planned development works. Due to this the whole world is divided into the categories of developed and developing, rich and poor. On one hand, due to the uneven distribution of population in the world, most of the resources of the earth have been used, while on the other hand, due to lack of population, natural resources are lying unused. Therefore, for the equitable distribution of these resources, it is essential to implement sustainable policies in the context of resources and humans, for which two basic concepts emerge; the first concept is to create such an economy where there is no inequality in the society due to consumption and prosperity. While the second concept has become that sustainable development is neither in favour of humans establishing a friendly relationship with the ecosystem, but also gives direction to continue development.



Therefore, the policy of sustainable development makes the concept of sustainable development real with the ecology-friendly and human-first policy by making maximum use of scientific inventions and technology. Need for Sustainable Development- It is noteworthy that the unwise use of natural resources by humans and excessive exploitation of resources, the dreadful form of development has created such a situation in front of humans that despite wanting to, humans have become helpless in conserving resources, for which the principles of sustainable development are being emphasized at regional, national and international levels, for which many policies and schemes have been used at the government level which can save natural resources for a long time and ensure resource conservation and security for future generations because just as our ancestors have saved resources for us, in the same way, we will also have to conserve resources for future generations so that the creatures born in future can also live easily. But modern man has forgotten that the resources which he is exploiting indiscriminately are the parts of the life-giving ecosystem or system, if these are destroyed then the life system of the earth will be destroyed forever. Therefore, only optimum use and consumption of resources can preserve them for future generations, for which it becomes very important to lay the foundation of sustainable development across the world and there is a need to pay more attention to making national and international policies strict and global.

**Dimensions of Sustainable Development-** After evaluating various research and developmental works for sustainable development, it has been concluded that the dimensions of sustainable development can be achieved by humans in the following way.

1. Natural resources should be properly conserved.
2. Bio resources should be properly conserved
3. To make unused land useful to the maximum extent possible
4. To protect biodiversity
5. To use ecosystems sustainably
6. To make national economic development policies environment-oriented
7. Environmental planning, quality assessment, and environmental impact assessment from time to time
8. Integrated development of science and technology, balance in ecosystem such as pollution disposal, garbage disposal, biotechnology and bio-agriculture etc.

**Objectives of Sustainable Development-** The main objective of sustainable development is that the development work should be in coordination and adaptation with nature. Apart from this, there should be the ability to fulfil all the demands of the present generation and not to use resources by sacrificing desires and needs. Establishing harmony between the

present and the future is the main objective of sustainable development which is a well-planned plan to free the ecology, humans and animals from the possibilities of life for a long time and the deficiencies of resources. According to WCED, the objectives of sustainable development can be as follows.

1. To activate economic growth.
2. To increase productivity.

**Objectives of Sustainable Development-** The main objective of sustainable development is that development work should be accompanied by adjustment and adaptation to nature. Apart from this, there should be the ability to fulfil all the demands of the current generation and not to use resources by sacrificing desires and needs. Establishing harmony between the present and the future is the main objective of sustainable development, which is a well-planned plan to free the ecology, humans and animals from the possibilities of long-term life and the deficiencies of resources. According to WCED, the objectives of sustainable development can be as follows.

1. To activate economic growth.
2. To increase productivity and also to make arrangements for proper distribution among all sections of society.
3. To fulfill the needs of a healthy environment, employment, water, food and energy for every section of the society.
4. To ensure optimum level of population.
5. Conservation and enhancement of resource base.
6. Re-determination of the direction of technology so that the ability to control emergencies can be increased.
7. Integrating environmental and economic perspectives in the development-oriented decision-making process.

**Basic pillars of sustainable development-** To make sustainable development permanent, mainly three pillars have been placed on the world stage, which can be described as follows.

1. **Economic stability-** Economic development should be done in such a way that it continues for a long time and is beneficial for all sections of society. The difference between

the rich and the poor in all the countries of the world has taken economic inequality to a very high level, to control which the global community needs to come forward.

**2. Social stability-** All sections of the society should get equal opportunities in all works within the boundaries of the country so that basic needs can be fulfilled easily and mutual dissatisfaction does not spread in the society based on caste, class and language. 3. Environmental Sustainability- To maintain environmental stability, it is very important to conserve and use natural resources sustainably because the ecological system gets strength from environmental elements, and all biological and non-biological activities are conducted. Policies to integrate development processes are given more importance based on environmental elements, which ensures the safety of biodiversity and brings stability to environmental elements.

**Sustainable Development Goals-** To implement the concept of sustainable development at the grassroots level, 17 sustainable development goals were placed before the world for 15 years in the United Nations meeting held in New York from 25 to 27 September 2015, and the period to achieve them was set till the year 2030, in which 193 countries participated. The theme of this United Nations Summit is 'Sustainable Development Goals 2030: Achieving Sustainable Development'. The Sustainable Development Goals (SDGs) include new topics such as reducing or eliminating poverty at the global level, quality education system, gender equality, clean water and sanitation, economic and renewable energy, economic growth, innovation, reduction in inequality, climate change, peace and justice and sustainable consumption. The objective of all these goals is to create an inclusive and sustainable future. There is no difference between developed and developing countries in the goals of sustainable development and all countries will have to achieve these goals. These goals will not be based on the principle of leaving no country behind. The main goals of sustainable development can be understood as follows.

- 1. Goal - Complete elimination of poverty -** To eliminate extreme poverty from all the countries of the world. The definition of poverty is that a person living on US \$ 1.25 per day was placed in this category.
- 2. Goal - End hunger -** End hunger, promote food security and improve nutrition and sustainable agriculture.

- 3. Goal** - Healthy health and living standards - Provide a healthy life to all and improve the living standards of all.
- 4. Goal** - Quality education - Ensure inclusive and equitable, quality education and promote lifelong learning opportunities for all.
- 5. Goal** - Gender equality - Achieve gender equality and strive to empower all women and girls.
- 6. Goal** - Clean drinking water and sanitation - Ensure the availability of clean water and sanitation for all and promote sustainable economic development, as well as productive employment and equal work for all.
- 7. Goal** - Affordable and clean energy - Ensure access to affordable, reliable, sustainable and modern energy.
- 8. Goal**- Clean Work and Economic Growth- Promote sustained, inclusive and sustainable economic growth, while promoting productive employment and clean work for all.
- 9. Goal**- Industry, Innovation and Infrastructure Development- Build robust infrastructure, promote inclusive and sustainable industrialization and promote innovation.
- 10. Goal**- Reducing Inequality- Reduce intra- and inter-country inequality.
- 11. Goal**- Sustainable Urban and Community Development- Make cities and human settlements inclusive, safe, resilient and sustainable.
- 12. Goal**- Responsible Consumption and Production- Strengthen production and consumption patterns.
- 13. Goal**- Climate Change- Ensure urgent action to tackle climate change and its impacts.
- 14. Goal**- Life in Water- Ensure the conservation and proper use of oceans, seas and marine resources for sustainable development.
- 15. Goal**- Land and Life- Promote sustainable use of terrestrial ecosystems, secure forests, and try to stop the increasing loss of land degradation and biodiversity.
- 16. Goal**- Peace and Justice- Promote peaceful and inclusive societies for sustainable development, and establish access to solar energy for all.

**17. Goal-** Collective Partnership in Achieving the Goal- Revive global partnership for sustainable development and strengthen the means of implementation.

The above Sustainable Development Goals cover almost every aspect of human life. If these goals are achieved within the stipulated time, then it is certain that the life of the poor in the world will become easier and better options of living will be available to them. To bring the Sustainable Development Agenda 2030 into reality, all stakeholders will have to be taken along to implement the global goals. Sustainable development takes care to ensure that no development process hurts the environment and humans. Then the resources can be preserved for future generations.

**Principles of Sustainable Development** - No experimental principles have been formulated for sustainable development, but based on community experience and environmental impact assessment; some general principles have been formulated for sustainable development, the details of which are described as follows.

**1. Environmental Integration** - Integrating the environment into the development processes so that natural resources can be used in such a way that it emphasizes carrying out development work without harming the environment and biodiversity.

**2. Balanced Development** - Maintaining the balance between economic, social and environmental factors in all regions of the world so that there is no excessive pressure on any region and all regions develop equally. Apart from this, keeping in mind regional diversity, making separate policies for specific places, special economic assistance is provided to bring forward the economically backward nations.

**3. Equality and Inclusiveness** - Providing equal benefits of schemes to all castes, religions and communities in the spirit of world welfare, in which one has to work with the ideology of Vasudhaiv for all without discriminating based on social status, gender and other grounds. In sustainable development, plans are made to reduce inequalities and to work on the principle of public benefit to all sections of society.

**4. Principle of caution-** Assessment of negative impact keeping in mind environmental conditions and human health is kept in the caution principle of sustainable development. If any development plan has an adverse effect, be it on humans, animals or any part of the ecosystem, development processes are implemented carefully keeping all these aspects in

mind. Apart from this, care is also taken to ensure that the new development work does not have any long-term negative impact on the environment.

**5. Resource conservation for future generations-** In development plans, it has to be kept in mind that natural resources are conserved so that they can be kept safe for the new generations of the future so that development work can be kept smooth in time. Development work should not be obstructed due to lack of resources, nor should there be any negative impact on the developmental work of the current generation, i.e. this principle emphasizes on the continuous and long-term sustainability of resources. Need for Sustainable Development in Uttarakhand - The mountainous and unbalanced physical features of the state of Uttarakhand are the most useful places for the implementation of the goals of sustainable development because the development work being done here along with the physical structure is not being done in a planned format from the environmental point of view. For example, the construction work being done in the mountainous regions does not adjust with the geological features here and is also not capable of accepting destructive development.

The roads being built here, hydroelectric projects, railway line construction, and urbanization spreading in the plains and mountainous regions and all the human cultural activities of tourism development are promoting destruction along with development. To stop this, many environmentalists have organized mass movements at the local level like Chipko Movement, Pani Rakho Movement, Tehri Dam Movement, Pancheshwar Movement and Raksha Sutra Movement etc. from time to time to save the mountains and the ecology here, for which the need for sustainable development goals is felt in Uttarakhand. Sustainable development work in Uttarakhand state- Keeping in mind the objectives and goals of sustainable development in Uttarakhand, collective efforts are being made in various fields, so that natural resources can be conserved and the quality of life of the local community can be improved, besides, they can also be empowered economically, environmental protection, social upliftment and economic development have been mainly included in sustainable development. The Uttarakhand government has presented a vision for sustainable development in its document Uttarakhand Vision 2030, in which there is a plan to implement 100 percent of the United Nations Sustainable Development Goals, which aims to transform the economy of the state into a prosperous and healthy economy. As a sustainable development, the following works are mainly being done in the state.

**1. Environmental Protection and Rehabilitation-** The area of forests in the entire area of Uttarakhand state (2022) is 24,305 sq km which is 45.44 percent of the geographical area. Forests are the backbone of the state's economy, which directly and indirectly includes every person of the state, for whose protection, expansion and development a strong policy is required. At present, rainwater harvesting, check dams, raw ponds and plantations are being done for water conservation in forest areas and forest rehabilitation work is being done in the plain areas, due to which forest area expansion and security work is important. To protect forests from fire, the development of a system based on remote sensing technology, the use of aeroplanes and a separate forest fire safety training force is being prepared. To dispose of urban waste, there is a plan to protect the environment through door-to-door garbage campaign, promotion of electric-based vehicles in urban areas, and maximum use of renewable energy resources, which is based on the goals of sustainable development.

**2. Economic Development-** Economic development is also being developed by the goals of sustainable development. Most of the industrial areas been established after the establishment of the state, which meet the environmental and urban standards as per the planned plan, such as Pantnagar, Sitaganj, Haridwar, Dehradun, and Selaqui are planned industrial areas. New agricultural techniques are being incorporated by encouraging agroforestry along with agricultural development in urban areas, agricultural land development in rural areas, horticulture promotion and organic farming. To improve the economic condition of the state, tourist areas are being developed as eco-tourism, which is reusing the houses lying barren due to migration as homestays. Also, tourism is becoming a source of employment growth and livelihood. At present, the government is developing means of employment in the tourism sector by contributing up to 40 per cent. Apart from this, the government has been providing financial assistance for the last 5 years to economically empower the residents by contributing up to 50 percent for employment in solar energy. Self-employment to local artisans by reviving the local handicraft art of Uttarakhand, strengthening the economic condition of women through self-help groups, promotion and propagation of local agricultural products in local exhibitions by providing separate geographical identity certificates in the markets of the state as well as other outside areas, i.e. providing economic strength to the residents of Uttarakhand and work is being done on the policy of local product first.

**3. Social upliftment -** For social upliftment, education and health, women empowerment is being done in the state through many government and non-government organizations.



Providing separate reservations for women in government and non-government services with the goals of sustainable development, reserving 50 percent posts in political services, especially in local bodies, giving grants for employment, establishing Atal Adarsh and PM Shri schools for education, free education till 12th class and establishment of modern schools in hilly areas are continuous comprehensive steps for strengthening rural education. In the health sector, health services are being strengthened through health insurance coverage, free treatment, and mutual participation between government and non-government organizations. The medical field is being expanded naturally by reviving the Ayurvedic medical system, homoeopathic and yoga therapy received as heritage by the state. To provide health benefits to women, apart from Janani Suraksha, many types of free services are currently being provided. On the other hand, to make women self-reliant, many loan schemes are being run by making them skilled in self-employment skills, which is the most effective step towards women's self-reliance.

**4. Technology Upgradation and Capacity Development** - To achieve the goals of sustainable development, work is being done to continuously raise technology upgradation in the state, in which special initiatives are being taken on renewable energy sources to prevent climate change impact and load of hydroelectric projects, especially in the Himalayan region. For example, new research and techniques are being used for the development of solar energy and thermal energy which can solve the energy problem for a long time without harming the environment, government support for organic farming by freeing food and agricultural produce from the use of chemical medicines and fertilizers, development of organic pesticides and soil testing laboratory, recycling of waste material and making it useful again, thereby reducing the consumption of resources and reducing environmental damage. Priority is being given to construction work according to local art by adopting sustainable architecture for the construction of buildings according to the structure of mountainous regions and using local raw materials. Apart from this, local organic products are again being seen as an alternative to control plastic products, which will establish a balance between the current and future needs of Uttarakhand in the comprehensive approach of sustainable development, the objective of which is that along with development, the quality of life on earth can be improved without causing environmental damage and Uttarakhand can be given a separate special identity among the Himalayan states.

**Plans for sustainable development in the state of Uttarakhand-** All the government and non-government institutions working for the all-round development of the state are

currently working keeping in mind the policies of sustainable development, in which the State Planning Commission (SPC) is working the most as a "policy think tank" and is also implementing long-term policies and programs for directional and policy work of sustainable development. Apart from this, strategic harmony is being established for development works based on the priorities of the state by coordinating between various departments, along with this, importance is being given to reliable and strong sustainable schemes at the village level because even today many villages are deprived of the main streams of development works, in which infrastructure development and development of local economic resources are becoming means of livelihood and self-employment for the stakeholders. Self-employment schemes can prove to help prevent the biggest problem of the state, migration.

To operate a sustainable livelihood in the state, keeping in mind the values of sustainable development, the means of sustainable livelihood are being rapidly developed in the agriculture, horticulture and tourism sectors in the mountainous regions, in which the government is focusing special attention, the objective of which is to eliminate poverty in the state, provide food security, improve the inclusive economic level, create means of employment, infrastructure and innovation are being mainly included. To achieve all these goals, coordinated research and inter-university cooperation in the Himalayan regions are also currently being taken up through national and international universities and research institutes. Remedial measures for environmental crises- Environmentally sensitive areas are being identified and protected in the state, the objective of which is to control the weather events and disasters caused by the effect of climate change. For this, the State Himalayan Sustainable Development Forum (HSDF) has been established by the Chief Ministers of the Himalayan states, which draws attention to climate change and is working to promote science and technology in the Himalayan regions by cooperating in sustainable development.

Under the National Action Plan on Climate Change (NAC), work on sustainable development in the Indian Himalayan Region (IHTR) (practising science policies and cooperating and promoting sustainable development in the Himalayan region, communicating with stakeholders and strategies for adaptation to climate change in the affected areas, creating a network to support state and national action plans on climate change, giving suggestions for implementation of strategic adaptation plan and institutional framework) is being done. Besides, Govind Ballabh Pant National Institute of Himalayan Environment and Development has been working on climate change impact assessment and adjustment

strategies in the Indian Himalayan regions since 1988-89. The International Centre for Integrated Mountain Development (ICIDD) is working as an organisation of eight regional countries on the impact of climate change on the Hindukush Himalayas and climate change adjustment on Himalayan ecology and human livelihood, whose policies can be adjusted as a successful adjustment strategy in the future following sustainable development in the impact of climate change taking place in the climate of the Himalayan regions. Other measures adopted for the goals of sustainable development: To strengthen the traditional business of the local rural community for sustainable development and long-term adjustment in the Himalayan region, protect traditional agricultural business through traditional knowledge, promotion of modern agriculture, conservation of traditional seeds (Seed Village and Kaur Valley Scheme and marketing), use in agricultural activities, use of organic fertilizers, cross-breeding of local indigenous species of animals to provide a strong base to the animal husbandry business which is the foundation of agriculture, improvement of local animal breeds which are capable of adjusting in the Himalayan climate.

The same as for health improvement, the use of Indigenous and coarse grains (module, white corn, local pulses ghat, Bhat, rajma) again in the improvement of the food system, local citizen empowerment, re-production and marketing of handicraft items are being done by the government through fair price government support and non-government organizations so that the knowledge of local handicrafts can be preserved in the basin. In livelihood improvement, government efforts and NGOs are providing great support in economic improvement work and tourism activities along with educational and technical assistance. Strengthening traditional practices in Himalayan agricultural resource adaptive management, community livelihood improvement and crop diversification by administration of multi-institutions by scientific strategy of sustainable development and regional ecological sensitivities are also in the category of efforts to achieve the goals of sustainable development in Himalayan regions.

**Himalayan Ecological Development and Conservation Action Plan-** The Himalayan ecological resource unit is being developed as a conservation and development unit to make it useful for the long term. Under the conservation unit, 100% protected area for traditional activities and development units include agriculture and dairy development and gardens, while in ecological development planning, participatory resource management under the ecological development group and human resource development at the village level, joint forest management for adaptation through traditional methods are proposed as follows.

1. As a large part of the proposed conservation area has very sparse and reduced tree cover, rapid regeneration and afforestation programs, especially adopting fast-growing species.
2. Effective water and soil conservation measures should be taken in highly sensitive areas.
3. Development of water-covered areas and sources, watershed development work should be done in the forest and river water regeneration process. Sustainable development policies and suggestions in Uttarakhand state- Due to the uneven geographical conditions of Uttarakhand state uneven population distribution and the need for a separate policy for the development of hilly areas, many difficulties are faced in implementing the principles of sustainable development.

Therefore, action plans will have to be made according to different policies in plain and mountainous areas. Which, for the sustainable development of water resources, all the concerned departments and stakeholders should be interrelated and the implementation of a new policy should be developed by accommodating traditional and modern knowledge. In all the watersheds of the state, renovation and religious revival of ponds, lakes, canals in traditional form, and plantation of water absorbing forest species under social forestry and garden and geological water management generated by the bed, local water resource development, which includes traditional methods of the local community such as use of local material in construction works which is more capable of absorbing water, prohibition of concrete construction, construction of ponds and khals for rain water, use of modern techniques like remote sensing and geographical information system, development of agricultural species which consume less water, use of modern drip and sprinkler irrigation system, reduction in water consumption limit, strengthening the traditional agriculture, animal husbandry and handicraft business being implemented since years by the local community in livelihood and standard of living improvement works and bringing it back to its previous state, use of traditional crops, local seeds, wild food grains in food grains, conservation of local seeds, use of traditional crops, local seeds in food items, Emphasis will have to be laid on 25-30% participation of dairy products as in 30-35 years ago, production of organic agricultural products, providing free government assistance in agricultural crises, implementation of special grant schemes for the lower class community for equality in economic level and modernization of all means of livelihood, which will prove to be an appropriate adjustment strategy in achieving the goals of sustainable development.

**Traditional knowledge accumulation and resource use-** Uttarakhand's traditional methods and Indigenous knowledge of adjustment in its distinct local culture and difficult geographical conditions can prove to be helpful in sustainable development because this traditional knowledge is not only eco-friendly but also technically successful. For example, there has been a unique tradition of its method of agriculture, animal husbandry business method, and forest product knowledge which has been preserved for many generations with successful technology, in which the participation of local communities is important. Therefore, these traditions play an important role in creating a balance between development projects and the environment and also make resource consumption in Himalayan regions easier. Whereas in the plains, the inclusion of modern technology will be the best option for sustainable development. The traditional knowledge of the residents here provides support to the government and local community in achieving the goals of sustainable development if there is coordination between the government, local community and non-governmental organizations. In conclusion, a holistic effort will have to be made to implement the values of sustainable development in the state of Uttarakhand, only when the government, administration, stakeholders, local knowledge, technical knowledge and innovation are involved, then there will be harmony with the environment and environmental protection.

---

### ***13.4 SUMMARY***

---

Sustainable development is a concept of resource use and environmental protection which works to establish a balance between the present and future generations. Mainly, steps taken to fulfil long-term objectives of natural wealth and human welfare are included under sustainable development. Sustainable development means environmental protection along with economic strength, social harmony and judicious use of resources and policy suggestions to correct the imbalance caused by the exploitation of resources and the concept of a multi-dimensional approach for improvement in the affected areas. In sustainable development, keeping in mind the present crises and future obstacles, the work of making plans and finding new opportunities by the policymakers and inclusive rules are being formulated and technology and innovation are also included in traditional methods. Sustainable development means such development which works to provide conservation capabilities for the future along with the present needs. Sustainable development is a model that provides stability to economic, social and environmental stability. Sustainable development is committed to keeping humans moving forward for eternity, which is a means

of accelerating human prosperity and economic development without harming the ecosystem, which adopts the principle of development without destruction. The objective of sustainable development ensures the fulfilment of human needs in a fundamental form both in the present and future periods without any natural degradation. Need for Sustainable Development The irrational use of natural resources by humans and excessive exploitation of resources has created such a situation in front of humans that despite wanting, humans have become helpless in conserving resources, for which the principles of sustainable development are being emphasized at regional, national and international levels, only the optimal use and consumption of resources can preserve them for future generations, for which more attention needs to be paid to making the foundation of sustainable development global across the world. For sustainable development at the international level, in the year 2015, the United Nations has kept 17 goals of sustainable development for the whole world in the agenda of 2030. Thus, sustainable development work is adjustment and adaptation with nature and is a link to establish harmony between present and future.

---

### **13.5 GLOSSARY**

---

Sustainable development	Sustainable development is such development which conserves the environment and resources by keeping in mind the needs of the present and future.
Agenda 30	Agenda 30 is the action plan for sustainable development to achieve the 17 goals targeted by the United Nations in the year 2015 by the year 2030.
Natural resources	Resources obtained free of cost by nature like water, air, land, vegetation and minerals, and animals.
Resource conservation	Use of natural resources in such a way that it can fulfill the developmental works of the present time and the demands of future generations.

Useless land	Useless land is that land is not useful for humans at present or is not suitable for use such as deserts, mountainous regions and swamps.
Biodiversity	Biodiversity is the species diversity found among fauna and flora in the world.
Ecosystem	Ecosystem is the connection of fauna, flora and abiotic substances in the natural environment in the form of a chain.
Sustainable Use	Sustainable Use The concept of sustainable resource use is the concept of sustainable resource use in which development work is done without harming nature.
Environmental Planning	Environmental Planning is to plan for development work in advance by making friendly adjustments to the environment. It is called environmental planning.
Environmental Impact Assessment	Environmental impact assessment is the assessment of physical and chemical changes in the natural properties of the environment as a result of developmental work.
Biotechnology	Technology makes biological systems, living organisms and their products useful to humans.
Bioagriculture Development	Bioagriculture Development of agriculture and plants and crop production through biological methods..

---

### **13.6 ANSWER TO CHECK YOUR PROGRESS**

---

- Sustainable development is a planned framework to establish a balance between the present and future generations.



- Sustainable development policies and recommendations mainly have targets set for fulfilling the long-term objectives of natural resources and human welfare.
- Sustainable development aims to develop renewable sources of energy.
- Sustainable development policies prove helpful in dealing with the challenges of the global environment and resource exploitation.
- At the global level, the Montreal Conference, Earth Summit, Kyoto Conference, and Paris Conference are global steps towards sustainable development and environmental protection.
- Economic, social and environmental stability are included in the basic pillars of sustainable development.
- A meeting was organized in New York from 25 to 27 September 2015 to implement the concept of sustainable development at the grassroots level. 5 For sustainable development, the United Nations presented 17 goals to the world.
- 5 years till 2030 was set for achieving the goals of sustainable development.
- 193 countries participated in the meeting on sustainable development in New York.
- The theme of the United Nations Summit was 'Sustainable Development by 2030' to achieve this goal.
- The Sustainable Development Goals (SDGs) include major topics such as reducing or eliminating poverty at the global level, providing quality education, gender equality, clean water and sanitation, economic and renewable energy, economic growth, innovation, reduction in inequality, climate change, peace and justice and sustainable consumption.
- Environmental integration, balanced development, equality and inclusiveness are included in the principles of sustainable development.
- The mountainous and unbalanced physical features of the state of Uttarakhand are the most useful places for the implementation of the goals of sustainable development.
- The Uttarakhand government has presented the document Uttarakhand Vision 2030 for sustainable development.
- The State Planning Commission (SPC) is working as a "policy think tank" in sustainable development.

### 13.7 REFERENCES

---

- Baruch. Eirack, 2006: Environment Study, Orient Longman Private Limited. New Delhi.
- Koshik & Garga, 2006-2007: Resources and Environment, Rastogi Publication Merruth
- Maithani, D.D., Prasad Gaytri, Noutiyal Rajesh, 2015. Geography of Uttarakhand. Sharda Pustak Bhawan, University road Prayagraj. U.P.
- OJha. S.K. 2022. Uttarakhand. Baudhik Prakashan. Prayagraj.
- OJha.S.K. 2018, Ecology & Environment. Badfiek Prakasini Prayagraj. UP.
- Singh. S. 1974. Physicized Geography, Ecosystem and Ecology Basundhara Publication Gorakhpur.
- [www.bing.com/search?pqlt=41&q=sustainable+development+goals](http://www.bing.com/search?pqlt=41&q=sustainable+development+goals)
- [www. State Planning Commission - SETU \(uk.gov.in\)](http://www.StatePlanningCommission-SETU(uk.gov.in))

---

### 13.8 TERMINAL QUESTIONS.

---

#### (A) Long question

**Q.1-** Explain the meaning and concept of sustainable development and describe the goals of sustainable development set by the United Nations?

**Q.2-** Describe the basic pillars and principles of sustainable development and elaborate on the works and suggestions done for sustainable development in Uttarakhand?

#### (B) Short answer type question

**Q.1-** Write the meaning and definition of sustainable development?

**Q. 2- Why** is the need for sustainable development being felt at present? Write in brief?

**Q.3-** What should be the main policies of sustainable development?

**Q.4-** What are the main pillars of sustainable development?

**Q. 5-** Describe the principles of sustainable development?

**Q. 6-** Describe the goals of sustainable development set by the United Nations?

**Q.7-** Why is a sustainable development plan necessary in the state of Uttarakhand?

**Q. 8-** What can be the dimensions of sustainable development, explain?

**Q.9-** Why is resource conservation necessary for future generations?

**Q.10-** Explain how technology upgradation and capacity development can be helpful in environmental protection and rehabilitation.

**Q.11-** What are the plans for sustainable development in the state of Uttarakhand?

**Q.12-** Discuss in detail the measures adopted for the goals of sustainable development in Uttarakhand.

**Q.13-** What is the Himalayan Ecology Development and Conservation Action Plan?

**Q.14-** Describe the policies and suggestions for sustainable development in the state of Uttarakhand.

### **(C) Multiple Choice Questions**

**Q.1-** Sustainable development means?

- A) Establishing a balance between development work and the present and future generations.
- B) Accelerating development work
- C) Bringing economic development to the human beings
- D) All of the above

**Answer A**

**Q.2-** The concept of sustainable development is based on?

- A) On the economic model
- B) On the social model
- C) On environmental stability
- D) All of the above

**Answer D**

**Q.3-** The main objective of the policy of sustainable development is?

- A) Environmental protection
- B) Human first

- C) Environment and human first
- D) Development first

**Answer B**

**Q.4-** Why is the need for sustainable development being felt?

- A) Indiscriminate use of natural resources by humans
- B) Excessive exploitation of resources
- C) Crisis of bound development
- D) All of the above

**Answer D**

**Q.5-** What are the dimensions of sustainable development?

- A) Proper conservation of natural resources
- B) Proper conservation of biological resources
- C) Making national and economic development policies environment-oriented
- D) All of the above

**Answer D**

**Q.6-** The focus of sustainable development policies and recommendations is?

- A) Fulfillment of long-term objectives of natural wealth and human welfare
- B) Conservation of man-made cultural wealth
- C) Maximum exploitation of natural resources
- D) None of the above

**Answer A**

**Q.6-** What is included in the goals of sustainable development?

- A) Developing renewable sources of energy
- B) Eradicating poverty

- C) Protecting the environment
- D) All of the above

**Answer D**

**Q.7-** The conferences held at the global level for sustainable development include?

- A) Montreal Conference
- B) Earth Summit
- C) Kyoto Conference, Paris Conference
- D) All of the above

**Answer D**

**Q.8-** The basic pillars of sustainable development include?

- A) Economic development
- B) Social development
- C) Environmental sustainability
- D) All of the above

**Answer D**

**Q.9-** When was the meeting held in New York City for sustainable development?

- A) 25 to 27 September, 2015
- B) 26 to 28 September 2016
- C) 25 to 27 September, 2017
- D) 26 to 28 September, 2018

**Answer A**

**Q.10-** How many goals have been set by the United Nations for sustainable development?

- A) 15 Goal
- B) 16 Goal

C) 17 Goal

D) 18 Goal

**Answer C**

**Q.12-** What is the period of how many years has been kept for achieving the goals of sustainable development?

A) 15 years 2029

B) 16 years 2031

C) 15 years 2030

D) 18 years 2032

**Answer C**

**Q.13-** How many countries participated in the meeting on sustainable development?

A) 192 countries

B) 193 countries

C) 194 countries

D) 195 countries

**Answer B**

**Q.14-** Why is there a need to implement sustainable development in the state of Uttarakhand?

A) Mountainous and unbalanced physical condition

B) Sensitive environmental condition

C) For new mountainous areas and development works

D) All of the above

**Answer D**

**Q.15-** In what form is the State Planning Commission (SPC) working in sustainable development?

A) “Niti Think Tank”

**B)** Niti Water Tank

**C)** Forest Tank

**D)** Resource Tank

**Answer A**





## **UTTARAKHAND OPEN UNIVERSITY**

**Teenpani Bypass Road, Behind Transport Nagar,  
Haldwani- 263139, Nainital (Uttarakhand)  
Phone: 05946-261122, 261123; Fax No. 05946-264232  
Website: [www.uou.ac.in](http://www.uou.ac.in); e-mail: [info@uou.ac.in](mailto:info@uou.ac.in)  
Toll Free No.: 1800 180 4025**