



HIMACHAL GEOGRAPHY

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AWSM NOTES

ANALYSIS: SYLLABUS AND PREVIOUS YEAR PAPERS

1. Geography of Himachal Pradesh

- Relief and Drainage
- River System in Himachal
- Lakes and Springs
- Prominent Glaciers and Valleys
- Mountain Passes and Peaks
- ✤ Vegetation cover and types.
- Climate and climatic zones in Himachal Pradesh.
- 1. Describe the major vegetation types in Himachal Pradesh.(2017, 20 marks)
- 2. Write a geographical note on Mantalai Lake.(2020, 4 marks)
- 3. Write a geographical note on Vishal Tal.(2021, 4marks)

2. Geographical Regions of Himachal Pradesh

- Shiwalik, Doons and Low Valleys
- Outer Valleys of Sub Himalaya
- Mid Hill Tracts of High Himalaya
- High hills and Valleys and Inner Zones
- 1. On the basis of topography and altitude which are the major geographical region in Himachal Pradesh?(2016, 8 marks)
- 2. Write a detailed geographical essay on Lesser Himalaya zone of Himachal Pradesh(2022, 8 marks)

3. Human Aspects

- Quantitative, Qualitative and Temporal characteristics of Population,
- Urbanisation pattern.

4. Disaster Management

Hazard Vulnerability and Risk Profile of Himachal Pradesh

5. Policies: (*Also Cover GS3)

- Forest
- Industrial
- Tourism Policies
- ✤ Growth of Industrial areas and types of Industries in Himachal
- Employment generation and potential
- Scope of future Industrialization
- 1. While given suitable examples, discuss the major hurdles in horticultural development of Himachal Pradesh. (2019, 8 marks)
- 2. Which are the main industrial regions in Himachal Pradesh and which are the major industries in them?(2016, 8marks)
- 3. Discuss the major problems and prospects of hydro power sector in Himachal.(2018, 8 marks)

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- 4. Discuss how cultural tourism is a tool for socio-economic development in Himachal Pradesh(2020, 4 marks)
- 5. How far do you agree that recreation and amusement are becoming part of cultural tourism?(2020, 4 marks)
- 6. The development of tourism industry in Himachal Pradesh has generated multifold employment opportunities.' Explain the statement with examples from various geographical regions of state.(2020, 20 marks)
- 7. Development has a cost element attached to it. What would be your suggestion for sustainable development in Himachal Pradesh? (2021, 4 marks)
- 8. Write a note on hydropower potentials, its development, and its significance for the economic development of Himachal Pradesh. (2021, 20 marks)
- 9. What are the main industrial regions of Himachal Pradesh.Which are the major industries in them (2022, 8 marks)

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QUESTION BANK

- 1. Give an account of the various Agro-Climatic zones of Himachal Pradesh. Also, discuss about the multiple crops sown in different zones.
- 2. Critically analyze the role of the industrialisation in socio-economic development of Himachal Pradesh. Also, mention various types of industries developed in Himachal Pradesh.
- 3. What are the challenges presented by the relief of Himachal Pradesh in terms of infrastructure development and connectivity?
- 4. Write about the major rivers that flow through the state of Himachal Pradesh, and how have these rivers contributed to the state's socio-economic development.
- 5. Define the concept of Climatic zone and throw a light on climatic zone in Himachal Pradesh.
- 6. Define 'doon valleys' and give example of doon valley in Himachal Pradesh .
- 7. Comment on Urban development in HP since colonial period.
- 8. HP is prone to man-made and natural disaster, Discuss the disaster profile of state. What steps has been taken by government in disaster management?
- 9. Put a light on economic importance of river Sutlej of Himachal Pradesh
- 10. Provide an overview of the glaciers of Himachal Pradesh.
- 11. On the basic of geographical relief which are the major geographical areas in Himachal Pradesh?
- 12. Write a short note on river Spiti in Himachal Pradesh .
- 13. What do you know about HIMUDA and mention at least two projects which HIMUDA is currently working upon
- 14. What steps has been taken by government of Himachal Pradesh in recent years to attract investment in order to strengthen industrial development in state?
- 15. Give a detail account of natural vegetation in Himachal Pradesh and what initiatives and steps has been taken by government in the direction of development and preservation of forest in state?
- 16. Write a short note on Drainage system in in HP.
- 17. Discuss in brief about famous mountain ranges and their importance in HP.
- 18. Himachal Pradesh has great Potential of medicinal Plants. comment
- 19. Analyse the importance of greater and Trans Himalaya for Himachal Pradesh
- 20. What are the objectives and aims of Himachal Pradesh industrial policy 2019?
- 21. Discuss about the Kiara-dun Valley in Himachal Pradesh.
- 22. Write a note on the scope and challenges of medicinal plants in Himachal Pradesh.
- 23. Briefly discuss the aims and strategy of Industrial policy in Himachal Pradesh.
- 24. Discuss in detail the river drainage system in Himachal Pradesh.
- 25. Comment on new tourism policy in Himachal Pradesh.
- 26. Give a brief account of Hazard venerability of Himachal Pradesh.
- 27. Which are the main industrial areas in Himachal Pradesh and which are the major industries in them?
- 28. What steps has been taken by Himachal Pradesh to promote small scale industries in Himachal Pradesh.
- 29. Describe the major scopes and problems of industrial sector in Himachal Pradesh.
- 30. Discuss the major problems and prospects of hydro power sector in Himachal Pradesh.
- 31. Write down the major objective of the Industrial Investment Policy of the state.
- 32. What are the threats that are responsible for forest degradation in the state?
- 33. What are the major mountain ranges that contribute to the relief of Himachal Pradesh?
- 34. How do the geography and environment of Himachal Pradesh influence its choice of industries?

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GEOGRAPHICAL RELIEF

In geography, **Relief** means the difference between the highest and the lowest points of elevation or height. H.P. is divided into three parts according to relief.

The Classifications are:

- The Highest Relief Zone (more than 5,100 m) It is found in the eastern part of the state, covering the western part of Kinnaur, the north-eastern margin of Shimla, and the south-eastern extreme of Kullu districts.
- Mid-High Relief Zone (2,400-3,300 m) It stretches across the state from north to southeast, encompassing the northeastern Chamba, Bara Bhangal in Kangra, and western-southwestern Lahaul and Spiti.
- Low Relief Zone This includes northwestern and central Kangra, eastern Hamirpur, Bilaspur, most of Mandi, all of Solan, and northwestern and central Sirmaur districts.

Major Mountain Ranges of the State:

The major mountain ranges that contribute to the relief of Himachal Pradesh are Shivaliks, the Lesser Himalaya, the Great Himalaya, and the Zanskar range, in an approximate south-to-north order.

- > The Shivalik Range It is also known as Manak Parbat.
 - ✤ Its altitude varies from 350m to 1500m.
 - ✤ Rainfall in this range varies from 150cm to 180cm.
 - * Part of Kangra, Hamirpur, Bilaspur, Una, Mandi, Solan and Sirmaur falls in this range.
- ▶ Inner Himalayas Its altitude varies from 1500m to 4500m.
 - * The main ranges in the Inner Himalayas are Dhauladhar and Pir Panjal.
 - Dhauladhar is also known as Maulak Parbat and it lies mainly in Chamba, Kangra and Mandi.
 - Pir Panjal separates from the Great Himalayas, near the bank of Satluj. It forms the water divide between Chenab on one side and Ravi & Beas on another side.
- ➢ Greater Himalayas − Its altitude varies from 5000m to 6000m.
 - * This range stretches along the eastern boundary and is intersected by the Sutlej River.
 - Within this mountainous expanse, you can find several famous passes, including Kangla Pass, Bara Lacha Pass, Parang Pass, Cheni Pass in Churah Pangi, and Pin Parvati Pass.
- The Zanskar Range The Zanskar Range, the easternmost range, separates Kinnaur and Spiti from Tibet and the Pangi area from Leh of Ladakh.
 - ✤ It has peaks up to 6816 m high. Some of the well-known peaks are Mount Gya and Reo Purgyil.

Challenges presented by the relief of Himachal Pradesh:

- Difficult Terrain The rugged terrain in Himachal Pradesh poses road and transport construction challenges due to steep slopes, narrow valleys, and winding roads, leading to higher costs and time.
- Landslides and Erosion The hilly landscape is susceptible to landslides and soil erosion, especially during heavy rainfall or earthquakes. This poses a risk to existing infrastructure and requires ongoing maintenance efforts.
 - E.g., Over 80 earthquakes with a magnitude of 4 or higher on the Richter scale have shaken the state throughout recorded history.
- Harsh Weather Conditions Extreme weather conditions, including heavy rainfall during monsoons and snowfall during winters, can disrupt transportation networks, making it challenging to maintain year-round connectivity.
- Limited Space The mountainous terrain limits available flat land for building infrastructure, forcing planners to work with constrained areas for expansion and construction.

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- ♦ E.g., Himachal Pradesh has a mere 4-5% of its total area classified as plains.
- Disasters Natural disasters, along with human negligence, destroyed the developed infrastructure like roads, bridges, etc. which further hindered the pace of infrastructure development and connectivity projects.
 - E.g., in recent destruction in the state due to heavy rainfall, the state lost around Rs.10,000 crore.
 - ↔ Around 40 major bridges and many national highways were destroyed in this year's monsoon.
- Isolation of Communities Many remote villages are located in difficult-to-reach areas due to the relief. This isolation hampers access to essential services, healthcare, and education.

DUNS IN HIMACHAL PRADESH

Duns are elongated and tectonically formed longitudinal valleys that run parallel to the Shivaliks.

Formation of Duns:

- > Duns formed by the folding process when the Indian plate collided with the Eurasian plate.
- Folding led to the creation of an enclosed valley, which obstructed the flow of rivers and formed a large lake.
- With time, large sediments like sands, silt, clay, boulders, conglomerates, granules etc started to accumulate within the lake.
- > When water flow breaks the barriers, water seeped away and left behind an elongated valley, called Duns.
- E.g., Nalagarh Dun, Kiara Dun, Jaswan Dun, etc.

Kiara Dun Valley:

- > Location Located in the southeastern corner of the state, this valley is also known as the "Paonta Valley".
 - The valley is nestled between the Markanda and Dharti ranges.
- Historical Background In the not-so-distant past, this valley was a dense forest inhabited by wild animals. Settlement in the region began during the rule of Raja Shamsher Singh.
- Features The Yamuna River serves as the natural boundary between Kiarda Dun and Dehra-Dun.
 - The majority of the Kiarda Dun valley, which is flat, falls within the Cis-Giri division, with a small portion extending into the Giri division.
 - ✤ The valley is drained by the Giri and Bata Rivers.

Nalagarh Dun Valley:

- Location The Nalagarh Valley is a lengthy region surrounded by the spurs of the outer Himalayas to the northeast and the heavily eroded Shivalik range to the south and west.
- Guardians of History Numerous forts, including those at Chamba, Surajupur, Ramgarh, and Malaon, can still be seen in the valley, bearing witness to its historical significance.
- Crops Grown The major cereal crops cultivated in this area are maize and wheat. Additionally, the region is known for commercial crops such as tomatoes, ginger, carnations, and capsicum, which are grown in greenhouses.

Jaswan-Nurpur Valley:

- Location Jaswan was an ancient Indian state centred around Rajpura in present-day Himachal Pradesh, founded in 1170 by Raja Purab Chand, a descendant of the Kangra royal family.
- Nature of Soil The soil in this valley ranges from greyish to yellowish brown and varies from loamy sand to sandy loam.
- > Crops Grown Crops commonly grown include wheat, maize, paddy, gram, mustard, potato, and sugarcane.

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CLIMATE ZONES

A climate zone is a geographical area or region on the Earth's surface characterized by specific and relatively consistent patterns of climate conditions.

> These climate zones are defined based on factors such as temperature, precipitation, and other climatic features.

Climatic Zones in Himachal Pradesh:

Lower Tropical and Subtropical Climate Region:

- * This region covers the southern, southwestern, and western parts of the state.
- Average summer temperatures in the southern foothills are around 30 degrees Celsius, while winter temperatures average about 18 degrees Celsius.
- ***** It is further divided into two sub-climates:
 - Tropical Climate Found in the southern and western foothills of the Shivalik range, including areas like Paonta, Amb, Nalagarh, Changar, Una, and Nurpur.

It experiences seasonally high rainfall, hot summers, and pleasant winters.

Subtropical Climate - Predominantly found in the lower Himalayan ranges and valleys below an elevation of 1500 meters.

Districts like Chamba, Kangra, Hamirpur, Bilaspur, Una, Solan, and Sirmaur fall into this zone.

It has relatively milder summers and cool winters, with temperatures ranging from 20-30 degrees Celsius in summer and 15-20 degrees Celsius in winter.

Middle Temperate Climate Region:

- This zone encompasses the middle and upper parts of the state, including Chamba, Kangra, Mandi, Shimla, and Kullu districts.
- Rainfall varies from 100 to 200 cm, decreasing with higher elevations toward the Greater Himalayan range.
- The entire zone experiences a temperate climate with mild summers and cool winters.
- Summer temperatures range from 10 to 20 degrees Celsius, while winters can drop below freezing point.
- This region can be further classified into two categories:
 - Wet Temperate Climate Primarily found on wet mountain slopes, including areas like Dalhousie, Dharamshala, Kangra, and Palampur.

Summers are pleasant, with temperatures ranging from 15 to 20 degrees Celsius.

Dharamshala is the wettest place in Himachal Pradesh and falls within this climatic zone.

- Moist Wet Temperate Climate Dominates regions like Shimla, Kotgarh, Narkanda, Kullu, and Chamba, located at altitudes between 1500 to 3500 meters.
 - This climate is characterized by rapidly changing conditions, with temperatures ranging from 10 to 16 degrees Celsius and an annual rainfall of 100 to 250 cm. It is also known as the cool humid temperate zone and is prone to cloud bursts.

Higher Alpine Climatic Region:

- This region remains under snow cover for about 5 to 6 months.
- * It encompasses the Lahaul-Spiti, Pangi, and Bharmaur areas in Chamba and the entire Kinnaur district.
- Due to intra-zonal differences, it can be further divided into two regions:
 - Sub-Alpine Climate This zone lies in a rain shadow area, resulting in arid conditions.

It's also referred to as the high mountain cloud zone.

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Alpine Climate and Freeze Arctic Zone - Upper reaches of Lahaul-Spiti, Pooh in Kinnaur, and Pangi in Chamba fall under this category.

These areas house all of Himachal Pradesh's glaciers and are susceptible to climatic hazards like avalanches, landslides, and rockfalls.

Agro-Climatic Zones in Himachal Pradesh:

- Shivalik Hill Zone It is characterized by its subtropical climate, which encompasses the foothills and valley regions, ranging from 350 to 650 meters above sea level.
 - Area Covers This zone covers approximately 35% of the state's total geographical area and accounts for about 40% of the cultivated land.
 - Crops Grown Primary crops cultivated in this region include wheat, maize, paddy, gram, sugarcane, mustard, potatoes, and various vegetables.
- > Mid Hill Zone It spanning from 651 to 1,800 meters above sea level, enjoys a mild temperate climate.
 - Area Cover It occupies roughly 32% of the state's total land area and supports around 37% of its cultivated land.
 - Crops Grown Key crops grown in this zone comprise wheat, maize, barley, black gram, beans, and paddy.
- High Hill Zone It is situated between 1,801 and 2,200 meters above sea level, features a humid temperate climate with alpine pastures.
 - Area Covered This zone encompasses approximately 35% of the state's geographical area and contributes to about 21% of its cultivated land.
 - Crops Grown Commonly cultivated crops include wheat, barley, lesser millets, pseudo-cereals like buckwheat and amaranthus, maize, and potatoes.
- Cold Dry Zone It encompassing Lahaul-Spiti and Kinnaur Districts, as well as Pangi Tehsil in Chamba District, is situated at an altitude of approximately 2,200 meters above sea level.
 - ✤ Area Covered This zone covers around 8% of the state's geographical area and only 2% of its cultivated land.
 - Crops Grown Primary crops cultivated in this zone include wheat, barley, and pseudo-cereals such as buckwheat and amaranths.

Reasons for Presence of Various Climatic Zones in Himachal Pradesh:

- Altitude Variation: The state's varied topography, spanning from low-lying foothills to towering Himalayan peaks, ranging approximately from 350 meters to as high as 7,000 meters, is a significant influencing factor.
- > Latitude Himachal Pradesh spans a considerable north-south distance $(30^{\circ} 22' 40'' \square \square 33^{\circ} 12' 40'' \square)$, affects the angle and intensity of solar radiation, which impacts temperature.
- Rain Shadow Zone The Great Himalayan range blocks moist air from the southwest, creating a rain shadow effect in northern areas like Lahaul-Spiti and Kinnaur, making them arid, while southern regions receive higher rainfall.
- Glacial and Snow-Covered Regions High-altitude regions like Lahaul-Spiti and Kinnaur are snow-covered for months, resulting in a distinctive alpine climate and the formation of glaciers and permafrost.
- Geological Features The presence of geological features like valleys and mountain ranges create wind patterns and influence local climate.

Benefits of Having Different Climatic Zones in Himachal Pradesh:

- > Biodiversity Himachal Pradesh's diverse climatic zones support a wide variety of flora and fauna.
- Tourism Himachal Pradesh's diverse climates draw tourists year-round. Winter sports in snowy areas and summer treks in lush valleys offer varied attractions, boosting tourism.

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- Agriculture The different climatic zones in Himachal Pradesh allow for the cultivation of a wide range of crops, fruits, cereals, dry fruits, etc.
- Ecological Diversity The presence of various climatic zones helps in preserving different ecosystems, such as forests, wetlands, and grasslands.
- Climate Resilience The existence of different climatic zones can enhance the region's resilience to climate change.
- Cultural Diversity Himachal Pradesh's climatic diversity shapes local culture and traditions as people adapt to their surroundings, creating a rich cultural tapestry.
- Research and Education Himachal Pradesh's climatic diversity facilitates research and education on climate change impacts and ecosystem conservation by academic and research institutions.

Hence, Himachal Pradesh's climate diversity contributes to the state's unique natural beauty, economic sustainability, and environmental well-being.

DRAINAGE SYSTEM

The flow of water through well-defined channels is known as 'drainage' and the network of such channels is called a 'drainage system'.

The drainage system of Himachal Pradesh can be broadly classified into two major river systems - the Indus River system and the Ganga River system.



- Indus River System The western part of Himachal Pradesh is part of the Indus River basin. The major rivers of this system that flow through the state include:
 - Sutlej River The Sutlej is the longest river in Himachal Pradesh. It originates from the Mansarovar Lake in Tibet and enters Himachal Pradesh near the Shipki La pass.

It flows through the Kinnaur, Shimla, Kullu, Solan, Mandi and Bilaspur districts and then enters Punjab. The Bhakra Dam, one of India's highest gravity dams, is constructed on the Sutlej River in Himachal Pradesh. Main tributaries – Spiti River, Baspa River, Gambahr River, etc.

- **Beas River** The Beas River originates near Rohtang Pass in the Pir Panjal range.
 - It flows through the Kullu Valley, Mandi, and Kangra districts, making it an important river for agriculture and hydroelectric power generation.
 - The Beas River eventually flows into Punjab and merges with the Sutlej River.
 - Main tributaries Parbati River, Sainj River, Banganga, etc.
- Chenab River The Chenab River originates from the Bara Lacha Pass in the Lahaul and Spiti districts of Himachal Pradesh. It's formed by the confluence of two major streams, the Chandra River and the Bhaga River at Tandi.
 - It flows in the Lahaul-Spiti district and then enters the Pangi valley of Chamba district near Bhujind and leaves the district at Sansari Nala to enter the Podar valley of Kashmir.

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- ✤ It flows in Himachal for 122 km.
- **Ravi River** Ravi originated at the Bara-Banghal area of Kangra district at an elevation of 5000 meters.
 - ✤ It is fed by Bhadal and Tat Gari glaciers,
 - ✤ It flows through the Kangra and Chamba districts.
 - ✤ It leaves H.P. to enter Kashmir at Kheri.
 - Main tributaries Bhadal River, Siul River, Baira, etc.
- Ganga River System The Ganga River doesn't have a significant drainage system in the state of Himachal Pradesh. Its only tributary in Himachal Pradesh is Yamuna, which makes the border between H.P. and Uttrakhand.
 - Yamuna River Yamuna originated from the Yamunotri glacier at Bunderpunch range in Uttarakhand.

It enters Himachal at Khadar Majri in the Sirmaur district and leaves Himachal near Tajewala. Main Tributaries:

- Giri River It arises from Kuper Peak, just above Jubbal town in Shimla district. It divides the Sirmaur district into two equal parts known as the Cis-Giri and Trans-Giri regions.
- Tons River It originates as two feeder streams, the Rupin and the Supin River, which meet at Natiwar to form Tons. It joins Yamuna at Kalsi near Dehradun.
- > Bata River It arises near the Dharati range and joins Yamuna at Bata Mandi.

The Contribution of River Systems to Himachal Pradesh's Socio-Economic Development:

- Religious/Cultural Significance Many places along these rivers have significant religious and cultural significance for the people of the state.
 - E.g., Tatapani Hot Spring along the bank of Satluj, Manikaran on the bank of Parbati River, Kardang Gompa is situated on the left bank of the Bhaga River, etc.
- Hydropower Generation The state's rivers are a key hydropower source, with many projects meeting local and national energy needs.
 - About 27,436 MW of hydroelectric power can be generated in the state by the construction of various hydroelectric projects on the five perennial river basins.
 - Out of the total hydroelectric potential of the state, 10,519 MW is harnessed so far.
- Irrigation The construction of dams and reservoirs has enabled efficient irrigation of agricultural land, boosted crop yields and improved rural livelihoods. Major irrigation projects are;
 - Shah Nehar Irrigation project This is the only major irrigation project in the state, situated in the Kangra district. It provides irrigation facilities to 15,278 hectares of land in the region.
 - Other minor irrigation projects are Sidhata IP (Kangra), Changar IP (Bilaspur), Balh Valley Left Bank IP (Mandi), etc.
- Water Supply The rivers serve as sources of freshwater for domestic, industrial, and agricultural use, catering to the needs of both rural and urban populations.
- Tourism The scenic beauty of the river valleys, along with recreational activities like rafting and fishing, attracts tourists and contributes to the state's tourism industry. Along with it, rivers also provide a platform for national-level river games.
 - E.g., The Asian Rafting Marathon was decided to be held in the Beas River near Nadaun in September 2023, but delayed due to heavy destruction in the state.
- Transportation Rivers have historically facilitated transportation within the state, aiding trade and connectivity in remote areas.
 - E.g., at present the activities of water transport are operational only at four chief water bodies in the state.

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- They are Pandoh Lake (on the Beas River) of district Mandi, Gobind Sagar Lake (on the Satluj River) of Bilaspur district, Chamera Lake (on Ravi) of Chamba district and Kangra district's Pong Lake (on Beas).
- Economic Growth Abundant water, energy, and fertile land boost agriculture, industries, and services, driving the state's economic growth and livelihood opportunities.
 - E.g., The commercially important fish species in Govind Sagar Lake, Pong Dam Reservoirs, Chamera Lake and Ranjit Sagar Dam have become a tool for the upliftment of the local population
 - ♦ About 5,567 fishermen in the state depend directly on reservoir fisheries for their livelihood.

The rivers of Himachal Pradesh are the lifeblood of the state, nurturing its communities and fostering prosperity while preserving its cultural heritage.

VEGETATION OF HIMACHAL PRADESH

The term "vegetation cover" refers to the presence and arrangement of plants, including various types, sizes, and densities of vegetation, across a particular geographic area or landscape. It describes the extent and characteristics of plant growth within that region.

The various Vegetation Regions and Forests of the Himachal Pradesh are:

- Lower Tropical and Subtropical Vegetation Region (Up to 1500m Elevation):
 - Tropical Vegetation (350m to 750m) Found in the southern, southwest, and western foothills of Shivalik and the lower Himalayan ranges.

Mainly composed of tropical thorny forests consisting of shrubs, bushes, and deciduous trees, including species like Khahir, Kikar, and Phulai, etc.

Subtropical Vegetation - Primarily located in the lower Himalayan ranges, up to an elevation of 1500m.

Economically valuable trees in this region include Sal, Shisham, and Sarin, while Chir-Pine is a common tree species.

- Middle Temperate Vegetation Region (Spread in Chamba, Kangra, Mandi, Shimla, and Kullu Districts):
 - Wet Temperate Forest (1200m-3600m) These forests, intermixed with chir, pine, and deodar trees, are primarily found on the wet mountain slopes of areas like Dalhousie, Dharamshala, Kangra, Palampur, and along the Dhauladhar mountain range.
 - Moist Deodar and Kail Forest Valuable timber forests found in Shimla, Kogarah, Narkanda, Nahan, Kullu-Sreaj, Chamba, and Churah.
 - Species like Hazelnut, Maple, Chilgoza Pine, Ash, and others are important in these forests.

> Higher Alpine Vegetation Region (Northeastern Part of the State):

Sub-Alpine Vegetation - Commonly found above 3500m, dominated by species like Kharsu and Birch.

Moist scrub forests are present above the tree line (i.e., 4000m), consisting mostly of evergreen trees. The moist vegetation includes shrubby components, meadows, and a variety of colourful flowers and herbs.

- > Dry Alpine Vegetation Typically found in Kinnaur, Lahaul-Spiti, and Pangi areas of the state.
 - ✤ Alpine pastures and meadows are characteristic features of this forest type.

Role of Vegetation Diversity in the Economic Development of State:

- Tourism Himachal Pradesh's diverse vegetation, ranging from lush forests to alpine meadows, contributes significantly to its attractiveness as a tourist destination.
 - This influx of tourists boosts the hospitality, transportation, and handicraft industries, contributing to the state's economy.

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- Agriculture and Horticulture The state's diverse vegetation allows for a wide range of agricultural and horticultural activities.
 - Different regions support the cultivation of various crops such as wheat, maize, apples, plums, pears, tomatoes, potatoes, etc. due to the varying climatic conditions and altitudes.
- Medicinal Plants and Herbal Industry: Himachal Pradesh hosts valuable medicinal and aromatic plants used in systems like Ayurveda, thanks to its diverse vegetation.
 - * These plants hold significant commercial value in the herbal and pharmaceutical industries.
 - E.g., the plantation of sea buckthorns also known as "chharma" will be undertaken on 250 hectares in Lahaul & Spiti and Kinnaur districts in five years, which will boost the economic prosperity of these areas.
- Forestry and Timber Industry The state's forests are an important source of timber, wood products, and nontimber forest products (NTFPs) like resin, gum, and medicinal plants.
 - E.g., HP Van Samridhi Jan Samridhi Yojana will ensure economic returns to rural households who are engaged in collecting and selling Non-Timber forest produce which includes medicinal plants.
- Hydropower Generation The diverse vegetation, especially in the upper catchment areas, contributes to maintaining the health of water bodies and watersheds.
 - Healthy watersheds ensure a steady supply of water for hydropower generation, which is a significant source of revenue for the state.
- Biodiversity Conservation Biodiversity conservation is essential for maintaining the ecological balance, preventing soil erosion, and supporting pollinators and other essential ecosystem services that indirectly contribute to the economy.
- Food processing industry With diverse plantation capability and production of a large number of fruits, H.P. has the potential for the development of the food processing industry.
 - The Ministry of Food Processing Industries (MFPI) launched a Centrally-sponsored scheme termed State Mission on Food Processing (SMFP).
 - The Mission was developed to increase the production of food crops and to promote the sustainable agricultural sector in the state of Himachal Pradesh.

Threats to the Vegetation Diversity of the State:

- Climate Change Climate change-induced global warming has led to the extinction of numerous plant species in the state, with many others now categorized as endangered.
 - E.g., threatened plant species from HP include Mohra, Atis, Salam Panja, Ner Dhoop and Ratanjot, etc.
- Hydro Power Projects The construction of HEP projects is also responsible for the submergence of large amounts of flora in the adjacent areas.
- Disasters Himachal Pradesh is susceptible to various disasters such as landslides, flash floods, avalanches, and more, all of which contribute to the destruction of vegetation.
 - Recent disaster in the state is a living example.
- **Forest Fires** One of the major respondents of the vegetation loss in the state.
 - E.g., between April 1, 2022, and June 30, 2022, 2,763 forest fires affected over 23,000 hectares of area, including new plantations in the state.
- Over Development Mindless and unscientific road construction and cutting of trees to cater for the needs of the growing tourist industry have led to vegetation loss.
 - E.g., More than 80 thousand trees have been cut for the highways in Himachal Pradesh.
- **Exotic Species** Exotic species are a major concern for the state as they replace the natural vegetation of the state.

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E.g., Lantana Camara, Blue pine an invasive exotic species that is edging out the local oak, etc.

Initiatives Taken by State Government to Protect and Preserve Natura Vegetation:

- Van Mahotsava Van Mahotsav celebrated at State, Circle and Division levels to educate the masses and generate awareness amongst all stakeholders regarding forestry and environmental concerns under the Forestry Scheme (Sanjhi VanYojana).
- Forest Management (Forest Fire Prevention & Management Scheme) The Forest Fire Prevention and Management Scheme (FPM) is the only centrally funded program specifically dedicated to assisting the states in dealing with forest fires.
- Samudayik Van Samvardhan Yojna The main objective of this scheme is to ensure the participation of local communities in the conservation & development of forests through the plantation, improving the quality of the forest and increasing the forest cover.
- Vidyarthi Van Mittar Yojna The main objective of the scheme is to sensitize the students about the importance of forests and their role in environmental conservation, to inculcate in students a sense of attachment towards nature conservation.
- Van Samridhi Jan Samridhi Yojna The objective of the scheme is to create employment in the rural and remote areas of the state and to improve the life standards of the villagers, along with forest conservation and management.
- **Ek Buta Beti k Naam -** To sensitize people about the importance of daughters and forest conservation.
- Externally Aided Projects -
 - The Himachal Pradesh Forest Eco-systems Climate Proofing Project It is supported by KfW Bank Germany and is underway in the Chamba and Kangra districts of Himachal Pradesh. This initiative spans seven years, commencing in 2015-16.

The project's main aim is to protect and revitalize forest ecosystems in Himachal Pradesh, making them more resilient to climate change. This will ensure ongoing benefits for forest-dependent communities.

Himachal Pradesh Forest Eco Systems Management and Livelihood Improvement Project – It has been started with the assistance of the Japan International Cooperation Agency (JICA).

In conclusion, Himachal Pradesh's diverse vegetation is not only an ecological treasure but a cornerstone of its economic prosperity. To secure this asset for future generations, continued efforts in conservation and sustainable management are imperative.

INDUSTRIES IN THE HIMACHAL PRADESH

Starting from almost nothing, the industrial journey of Himachal Pradesh has been spectacular.

The Significant Achievement in the Field of Industrialization in Himachal Pradesh:

> Before statehood, Himachal Pradesh was only restricted to a few industries;

- ✤ Salt mines at Darang;
- Mohan Meakines at Kasauli;
- Nahan Faundary Limited, Sirmaur.
- After attaining statehood, concerted efforts were made for significant infrastructure development at various places in the state.
- Till 2003-03, the growth rate was slow. Then PM Atal Bihari Vajpayee announced the industrial package for the state which became a growth accelerator for industrial growth.
- > Various areas developed as industrial hubs in the state after that. These are:
 - Baddi-Nalagarh situated in Solan district, the area is the biggest industrial hub of Himachal Prades. It was declared a Special Economic Zone (SEZ) in 2003, which provides tax exemptions and other benefits for

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industries.

The Baddi-Barotiwala-Nalagarh industrial belt is among Asia's largest pharmaceutical hubs.

- Chambaghat Established in 2011, it is a hub for electrical and electronic industrial products.
 - Amb situated in Una. Many units including Sonalika (Tractor manufacturer), Kamdhenu (Kamakshi) Saria Factory, and Him cylinders are located in this town.
 - Nagrota Bagwan situated in Kangra, the area also has an industrial area with small-scale industries.
- Recent development The Prime Minister laid the foundation stone of Bulk Drug Park at Haroli in Una district, which will be built at a cost of over Rs 1900 crore.
 - The Bulk Drug Park will help reduce dependence on API imports. It is expected to attract investment of around Rs. 10,000 crores and employ more than 20,000 people.
 - ✤ It will also give a fillip to economic activities in the region.
- ▶ Current Scenario While 7% contribution to state GDP in 1970, it is 31.23% in 2021-22.
 - Further, it contributes around 8% to the share of employment.

Types of Industries in Himachal Pradesh:

- Hydropower Industry Given its abundance of rivers and hilly terrain, Himachal Pradesh has focused on developing hydropower projects.
 - E.g., Sawra Kuddu HEP, Sainj HEP, Parbati HEP, Renuka Ji HEP, etc.
- **Tourism Industry** Tourism is a major industry in the state due to its natural beauty and cultural heritage. This includes adventure tourism, eco-tourism, and religious tourism.
 - E.g., Ski resorts, Organic Tourism, Pilgrimage Tourism, Film Tourism, etc.
- Agro-Based Industries The state promotes industries based on agricultural products such as food processing, fruit preservation, and wool processing.
 - E.g., apple production, Kangra tea, fruit jams, spices and herbs like cardamom, ginger etc. are the part of state's agro-based industry.
- Textile Industry The textile industry in Himachal Pradesh is mainly based on various skills like spinning, weaving, handloom etc.
 - E.g., Lahauli woollen gloves and socks, Kullu Shawl, Kangra Shawl, Chanba rural, etc,
- Pharmaceutical Industry Himachal Pradesh is home to a significant number of pharmaceutical companies, contributing to the pharmaceutical sector of India.
 - E.g., The Baddi-Barotiwala-Nalagarh industrial belt in Himachal Pradesh's Solan district is among Asia's largest pharmaceutical hubs.
 - The belt has nearly 700 top pharma companies, including industry leaders like Dr Reddy, Torrent Pharma, Alkem Pharmaceutical, Cipla, Sun Pharma, Unichem, Glenmark, and USV.
- Sericulture Industry Sericulture is emerging as one of the important cottage industries in the state.
- Mineral-Based Industry These primarily use mineral ores as their raw materials. The products of these industries feed other industries. Various major and minor minerals in H.P are:
 - Major Minerals Limestone, Barytes, Shale, Rock Salt, Silica Sand
 - Minor Minerals Trans of iron gold, lignite pyrite, natural gas and slates have been found in districts like Bilaspur, Kangra, Mandi and Solan.
 - Himachal Pradesh has a significant limestone reserve and the state hosts six cement plants, with two in Solan, two in Bermana, and one in Rajban, Sirmaur.

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- Forest Base Industry Forest-based industries in Himachal Pradesh use raw materials from forests for products such as furniture, paper, Katha, cutch, resin, turpentine, and medicinal and dhoop-based items.
- ▶ IT and ITES Industry In recent years, there has been an effort to develop the information technology and ITenabled services sectors, particularly in cities like Shimla and Dharamshala.

How the Geography and Environment Impacts the Choice of Industries in Himachal Pradesh:

- Agro-Processing industry Himachal Pradesh has four Agri-climatic zones that support a variety of agricultural products, like food grains, vegetables, spices, fruits etc.
 - ✤ All these products provide raw materials to these industries in sufficient quantity.
- Tourism and Hospitality Himachal Pradesh's picturesque landscapes, including mountains, valleys, rivers, and forests, attract a large number of tourists. This has led to the growth of industries such as hospitality, hotels, resorts, adventure tourism, and ecotourism.
 - E,g., Recreational Tourism (Shimla, Mandi, Kullu, Dharamshala, etc.), Adventure Tourism (Bir Billing Para Gliding, Skiing in Shimla), Pilgrimage Tourism (Naina Devi, Jawalimukhi, Chintpurni) etc.
- Hydropower Generation The state's abundant rivers and hilly terrain provide ideal conditions for hydropower generation.
 - Numerous rivers and streams offer the potential for the development of hydroelectric power projects, contributing to the energy sector and overall industrial growth.
 - E.g., Satluj River has the highest hydropower generation potential (13,332 MW- 48.6% harnessed) followed by Beas (5,995 MW-21.8% harnessed), Chenab (4,032 MW-14.7% harnessed), Ravi (3,237 MW 11.8% harnessed), and Yamuna (840 MW-3.1% harnessed).
- Handicrafts and Cottage Industries: The state's rich cultural heritage and availability of raw materials like wool, wood, and metals have fostered a thriving handicraft industry.
 - Artisans produce items such as textiles, carpets, wood carvings, and metalwork, which are in high demand both locally and internationally.
 - E.g., Kullu Shawal, Chamba Rumal, Kangra Tea, Chamba's Copper products, etc.
- Animal Husbandry: The hilly terrains are well-suited for grazing livestock, making animal husbandry an important industry.
 - Dairy farming and sheep rearing are common, contributing to the production of milk, wool, and meat.
- Medicinal Plants and Herbal Products: The diverse flora of the region includes many medicinal plants. This has given rise to industries focused on herbal products, traditional medicines, and Ayurveda.
 - E.g., "Nag Chhatri" (Trillium govanianum), "Brahmi" (Bacopa monieri), "Dhoop or Dhoop-Lakkad" (Jurinea macrocephaly), etc.
- Mining Himachal Pradesh's mineral-rich geology supports mining, including limestone, gypsum, and rock salt, making it ideal for cement plants.
 - E.g., there are a total of 14 big and small cement plants in Himachal Pradesh with the Adani Group's Darlaghat and Barmana facilities being the major suppliers.
- Plain Areas of state Though Himachal is a hilly area, some parts of district Una, Solan and Kangra have plain areas, which provide for the development of medium and large industries.
 - E.g., the Baddi-Bartoiwala-Nalaragh region has around 3000 Small, medium and large industries, Asia's one of the biggest pharmaceutical hubs.

Various Initiatives Taken by the Government of H.P. to Strengthened Investments Industries in the State:

Industrial Area Development - The government has allocated approximately 2,800 acres of land for the Industries

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Department to support future industrial growth.

- Global Investor Meet The department successfully organized the first Global Investor Meet and Ground Breaking Ceremony in 2019 to boost the state's economy and job opportunities.
- > **PM Formalisation of Micro Food Processing Enterprises (PMFMFPE):** As part of Atmanirbhar Bharat, the "PMFMFPE" initiative aims to formalize food-based micro-enterprises in the unorganized sector.
- Ease of Doing Business The government has implemented industry-specific reforms like the "Single Window Clearance System" and the "Himpragati Portal" for project monitoring, significantly improving the overall business environment.
- Land Availability Industries and sectors will receive land at a concessional rate, i.e., @50% in Category B and C Industrial Areas to promote start-ups and innovation projects.
- Stamp Duty Concession New industries will pay only 3% stamp duty on conveyance and lease deeds from the date of notification by the Revenue Department.
- Pollution Control Board Fee Concession New industries will receive concessions in obtaining consent from the H.P. Pollution Control Board.
- Interest Subvention New start-ups in the micro sector with investments up to Rs 25 lakh and employing at least 5 persons are eligible for interest subvention on loans.
- E-Governance Several government departments, including Industries, Excise and Taxation, Power, Labour, and Town and Country Planning, have adopted e-governance to enhance industry interaction and efficiency.

Critical Analysis of the Industrialisation of the H.P.:

Positive Aspects:

- Employment Generation Industrialization has led to the creation of job opportunities, reducing unemployment rates and providing a livelihood for the local population.
- E.g., Construction and manufacturing are two sub-sectors within the industry sector that proved the largest share of employment to the workforce employing 11 .53% and 7.61% of the state's working adults respectively.
 - Revenue Generation The establishment of industries contributes to the state's revenue through taxes, which can be used for public welfare and infrastructure development.
- E.g. From a 7% contribution to state GDP in 1970, it is contributing 31.23% to state GDP in 2021-22
 - Skill Development As industries grow, they demand a skilled workforce. This encourages skill development programs and improves the overall human capital of the state.
- E.g., the Himachal Pradesh Skill Development Policy (Him Kaushal), 2016, was adopted by the GOHP in June 2016 and provides a roadmap for the state's reform and growth of skill development initiatives.
 - Infrastructure Development The establishment of industries necessitates the development of infrastructure, including roads, transportation networks, and utilities, which benefits the region as a whole.
- E.g., work on a 50 km broad gauge railway line in Himachal Pradesh between Una and Hamirpur has taken on a war ground to boost trade, industrial development and the tourism industry.
 - Diversification of Economy Before industrialization, Himachal Pradesh was largely dependent on agriculture. Industrialization diversifies the economy and reduces the vulnerability to fluctuations in agricultural output.
- Challenges and Concerns:
 - Environmental Impact Industrialization can lead to pollution, deforestation, and resource depletion, posing a threat to the state's unique biodiversity.
- E.g., **PM2.5 concentration** \square Baddi is currently 9.5 times the WHO annual air quality guideline value i.e., $47.5\mu g/m^3$.
- A 2019 study by environmentalists Manshi Asher and Prakash Bhandari, on the impact of hydro projects in Kinnaur's ecology, revealed that more than 11,000 trees of 21 species were cut (till 2014) to pave the way for nearly a

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dozen power projects

- Cultural Impact The rapid influx of industries can disrupt traditional ways of life, affecting local cultures and communities. This can lead to social tensions and conflicts.
- E.g., Locals in Kinnaur are protesting approvals given to new hydropower projects, which they fear will destroy the chilgoza pine, an important cash crop in the region.
 - Unbalanced Development Due to the difficult terrain of Himachal Pradesh and the lack of area for industrial development, unbalanced development takes place in the region.
- E.g., there are around 44000 industrial establishments in the state, most of which are concentrated in the Baddi-Nalagar-Barotiwala and Amb region of Una district.
 - Land Use Conflict Industrial expansion can lead to conflicts over land use, as the state has limited arable land and land is also required for other purposes such as housing and tourism.
 - Resource Depletion: Industries often require substantial amounts of natural resources like water and minerals. Overexploitation of these resources can lead to scarcity, affecting both industries and local communities that depend on these resources.
- E.g., the state government has, since 1981, diverted more than 12,000 hectares of forests for hydropower projects, cement industries, tourism and road expansion, all ecologically destructive activities.

Way Forward:

- Sustainable Industrial Practices Promote eco-friendly industrial practices with stringent regulations and monitoring for compliance, focusing on waste management, emission control, and resource conservation.
- Eco-Friendly Industries Promote the development of rural and eco-friendly industries like organic farming, handicrafts, and sustainable tourism.
- > Community Engagement: Involve local communities in decision-making processes.
- Diversification of Industrial Zones Encourage the establishment of industrial zones in different parts of the state to reduce concentration in specific regions.
- > Alternative Energy Sources Like solar energy, Wind Energy, etc.
- Sustainable Tourism: Promote sustainable and responsible tourism practices to mitigate the impact on fragile ecosystems and local cultures.
- Education and Awareness: Raise awareness among industries, local communities, and tourists about the importance of preserving the environment and local cultures.
- Regulatory Reforms Continuously update and strengthen regulations related to industrial practices and land use to adapt to changing circumstances and minimize negative impacts.
- Research and Innovation Invest in research and innovation to find more environmentally friendly and culturally sensitive industrial processes.

Himachal Pradesh's industrial journey is a valuable case study in balancing economic growth with environmental and social concerns. Embracing sustainability is key to prospering while preserving the state's unique identity and resources.

Micro Small and Medium Industries in Himachal Pradesh

According to the state industries department, there are about 55,500 industrial units in the state, set up at an investment of more than Rs 52 thousand crore.

- > These units employ more than 4.63 lakh people.
- > 98.6 per cent of these units are small-scale enterprises.
- Maximum no. of units registered in Kangra which is account for 23.07% of total followed by Solan and Mandi which account for 13.35% and 10.14% respectively.

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Govt Initiatives to Promote the MSME Sector in Himachal Pradesh are:

- Mukhya Mantri Yuva Ajivika Scheme Geared towards unemployed youth, this scheme offers financial assistance and training for starting their ventures in sectors such as agriculture, manufacturing, and services.
- Credit Linked Capital Subsidy Scheme (CLCSS) This scheme aims to assist Micro and Small Enterprises in enhancing their technological capabilities. It offers a capital subsidy of 15% on funding obtained from institutions.
- This funding is intended to facilitate the adoption of established and advanced technology within authorized subsectors.
- Reimbursement scheme for ISO-9000 / 14001 / HACCP Certification Under this scheme, Micro and Small Enterprises (MSEs) with permanent registration are eligible to participate.
 - ✤ It offers reimbursement for expenses related to obtaining ISO-9000, ISO-14001, or HACCP certification.
 - The reimbursement covers up to 75% of the certification costs, with a maximum limit of Rs. 75,000 for each case.
- Single Window Clearance System Himachal Pradesh has established a single window clearance system to streamline the process of setting up and operating MSMEs. This simplifies procedures and reduces bureaucratic hurdles.
- International Cooperation Scheme This scheme was established by the government to assist MSMEs in participating in international events, trade fairs, conferences, meetings, workshops, and other foreign marketing activities.
 - * The goal is to facilitate industry learning, as well as to promote their products on a global scale.

Himachal Pradesh Industrial Policy 2019

The government of Himachal Pradesh introduced the H.P. Industrial Policy in 2019 to create an enabling industrial ecosystem in the state.

Objectives of the Policy are:

- Facilitate Investment Climate Provide guidance to foster a favourable investment environment for existing industries' growth and to attract new investments, thereby creating employment opportunities.
- Address Hindrances to Industrial Growth Specifically target obstacles hindering industrial progress and streamline procedures.
- Promote Ease of Doing Business Embrace digital processes and encourage self-certification to enhance the ease of conducting business.
- Boost the Food Processing Industry Establish effective linkages in both forward and backward directions within the food processing industry, with a focus on promoting agro-horticulture and rural prosperity.
- Empower the MSME Sector Foster the sustainable growth of the micro, small, and medium enterprise (MSME) sector throughout the state, creating employment opportunities for local youth and stakeholders.
- Encourage Start-ups and Entrepreneurship Promote the emergence of start-ups and entrepreneurial ventures to nurture a local base of entrepreneurs.
- Acknowledge Large Investments: Recognize and support substantial investments to amplify economic development, employment prospects, ancillary industries, revenue generation, and fair compensation for local resources.

Strategies to Achieve These Goals:

- Efficiency Unleashed: Streamlining processes and embracing self-certification to digitize clearances, fostering an environment conducive to doing business.
- Infrastructure Evolution: Elevating and expanding existing industrial infrastructure with the creation of a private land bank.
- > **Powering Growth**: Ensuring the availability of top-tier, cost-competitive power supply.
- Investment Catalyst: Rationalizing fiscal incentives, concessions, and facilities that directly impact investment, driving sustainability and growth.

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- Balancing Prosperity: Implementing graduated fiscal incentives, facilities, and concessions to promote equitable regional development.
- Local Employment Drive: Offering incentives, facilities, and concessions with an 80% Himachal Pradesh workforce requirement at all levels.
- Innovation Oasis: Creating an ideal ecosystem for nurturing startups and entrepreneurship, sustaining traditional cottage industries, and fostering technological advancements.
- Rural Economy Resurgence: Recognizing the importance of cottage handloom, handicrafts, food processing, and forging linkages with agro-horticulture and tourism for rural sector revitalization.

QUANTITATIVE QUALITATIVE AND TEMPORAL DIMENSIONS OF HIMACHAL PRADESH

Quantitative Dimensions

- Quantitative Dimensions refer to measurable aspects such as size, magnitude, amount, or weight that can be directly expressed in numerical values and are amenable to statistical analysis.
 - E.g., Population Size, Density, Sex Ratio, Literacy Rate, Morality, etc.

Quantitative Dimensions of Himachal Pradesh are:

- Population Growth According to the Census 2011, population of Himachal Pradesh is 68.65 lakh, saw a decennial growth of 12.94%.
 - ✤ Una district has observed highest decennial growth of 16.30%.
 - ✤ Lahaul Spiti show a negative growth rate i.e. -5%. The decline of population in this district is due to the migration of people.
- > **Population Density** The population density of H.P. is 123.
 - ✤ Hamirpur has the highest population density, followed by Kangra.
 - Districts are categorized into three groups based on population density:

High Density (Above 200) - Six districts exhibit high population density, with Hamirpur district leading at 406 persons per square kilometre.

- Medium Population Density (100-200) Only two districts, Sirmaur and Shimla, fall within the medium population density range, with densities of 188 and 159 persons per square kilometre, respectively.
- Low Population Density (Below 100) Four districts fall into this category, i.e., Kullu, Chamba, Lahaul Spiti and Kinnaur.
- Sex Ratio In Himachal Pradesh sex ratio is 972 females per 1000 males.
- ↔ Hamirpur (1096) has the highest sex ratio, followed by Kangra (1013) and Mandi (1012).
- ✤ Lowest sex ratio in district Kinnaur 818.
- Literacy Rate In Himachal Pradesh, there is an increase in literacy in the state from 76.5% per cent in 2001 to 82.80 % in 2011.
 - The male literacy rate is 90.83% and the female literacy rate is 76.60% according to the 2011 census.
 - ♦ The highest literacy rate is recorded in Hamirpur (89.01%) and the lowest in Chamba (73.19%).
- **Birth Rate** The birth of Himachal Pradesh is 16.6 per thousand population.
- Mortality Rate (or death rate) The mortality rate in Himachal Pradesh is 6.75 per thousand populations.
- Demographic Dividend of State:
- ➢ With a bustling young population of 35.25 per cent, Himachal has a clear advantage over other states as the literacy rate in this section is 95 per cent, among the highest in the country.
 - The share of the youth population is 35.25 per cent which is more than the national level of 34.80 per cent

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According to the report of the Economic and Statistics Department, named "Youth in Himachal Pradesh-2018", the youth population of Himachal has grown by 129 per cent in the last 40 years as compared to the 85 per cent growth rate of the general population.

As per Census, the total youth population increased from 10.56 lakh in 1971 to 24.20 lakh in 2011.

- > The fertility rate is falling significantly and the total fertility rate in urban areas has fallen below two children per woman.
 - The rate has come down from 2.2 in 2005 to 1.7 in 2015.
 - ♦ It is below 0.4 points from the population-stabilising "replacement level" of 2.1.
- > The sex ratio among the youth population stands at 972 females against 1,000 males in the age group of 15-34.
 - The percentage share of married women in the age group 15-19 has come down to 9.02 per cent showing a welcome shift.

Qualitative Dimensions

- > These are the sociological factors that cannot be measured physically.
 - E.g., Education Quality, Freedom from Crime and Hunger, Development, Diet and Nutrition, Race, Social Class, Wealth, etc.

Qualitative Dimensions of H.P.:

Education Quality:

Negligible Drop-Out Rate - As per a survey conducted by the Indian Market Research Bureau (IMRB), the dropout rate amongst school-going children is almost negligible, i.e., below 1%.

In fact, in districts like Bilaspur and Lahaul-Spiti, there are no out-of-school children.

Higher Education - Himachal Pradesh boasts strong higher education institutions, including IIT Mandi (ranked 67th in NIRF), NIT Hamirpur, IIIT Una, and colleges under HPTU. Additionally, IIM Sirmaur stands out for management education.

The current rate of students pursuing higher education in the state is 18%, and there are ongoing efforts to increase this figure to 50%.

- Other Initiatives to Improve Quality Education "Him Darpan Shiksha Ekikrit Portal" will be developed to deliver quality education to increase the effectiveness of the education system
- In 2018-19, the government introduced the "Medha Protsahan Yojana" to aid meritorious students in pursuing competitive exam coaching outside the state.
- Three schemes: Swaran Jayanti Gyanodaya Cluster, Srestha Vidyalaya Yojana, Swaran Jayanti Utkrisht Vidyalaya Yojana, and Utkrisht Yojana for Colleges aim to upgrade institutions with modern facilities and sufficient staffing.
- ➢ Health and Nutrition:
 - Number of Allopathic Institutions Himachal Pradesh has around 780 allopathic institutions, with an available bed capacity of 14,553.
 - National Family Health Survey Report on Nutrition The NFHS-5 conducted the survey in nearly 11,000 households in Himachal Pradesh.
- **Deteriorating Nutrition Indicators:** The state's children face a concerning decline in key nutritional indicators stunting, wasting, and underweight.
- **Underweight and Wasting Statistics:** A significant 25.5% of children in the state grapple with underweight issues, while 17.4% suffer from wasting, including 7% severely wasted.

Stunted Growth Concerns: Disturbingly, 30.8% of children under five exhibit stunted growth, a condition where

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height-for-age falls below WHO's normal standards for child development.

- The rural areas bear a heavier burden, with a 4.5% rise in stunted children since the last survey five years ago, indicating a more substantial prevalence compared to urban regions.
- **Regional Variation:** Chamba emerges as the most affected district with 42.6% of children suffering from stunting, followed by Bilaspur at 40% and Kullu at 36%.

Even in the least-affected district, Una, a significant 25% of children still face stunting, indicating a widespread issue.

- **Inadequate Diets:** A mere 19% of children aged 6 to 23 months in Himachal receive a sufficient diet, a concern further exacerbated in urban areas, where only 14.4% of children receive proper nourishment.
- **Breastfeeding Rates:** Encouragingly, 70% of children under 6 months are exclusively breastfed, marking a positive trend in infant care practices.
- > Crime Statistics of Himachal Pradesh:
 - Crimes Related to Narcotic Drugs and Psychotropic Substances (NDPS) Himachal has the third-highest crime rate under NDPS cases after Punjab (39.2) and Kerala (24.9).
 - Crimes Related to Forest Law Violation Himachal Pradesh holds the highest rate of forest law violations, with 240 cases registered under the Forest Act and Forest Conservation Act.
 - Crimes against Women Himachal Pradesh has a relatively low overall rate of crimes against women but ranks second in abetment to suicide of women, following Telangana.

Urban Growth in Himachal Pradesh

- > Urban Population Currently, the urban population of the state is 7.88 Lakhs but it is fast increasing.
- Number of Urban Local Bodies The state currently has 5 Municipal Corporations, 29 Municipal Councils and 27 Nagar Panchayats to provide qualitative municipal services in Urban Areas.
- District with Highest Urban Population Shimla has the highest urban population, followed by Solan and Kangra.
- Regions with No population Entire districts of Kinnaur, Lahul-Spiti and Pangi tehsil of Chamba were devoid of any urban population.
- > Sex Ratio In Urban areas, the sex ratio was 853 females per 1000 males.
- > Literacy Rate in Urban Area For urban areas in Himachal Pradesh, the average Literacy rate was 91.1%.
 - ★ The male literacy rate was 93.42% and female literacy rate was 88.37%.

HAZARD PROFILE OF HIMACHAL PRADESH

The state of Himachal is prone to various hazards both natural and manmade. The main hazards consist of earthquakes, landslides, flash floods, snow storms and avalanches, forest fires, etc.

- **Earthquake** The State has been shaken more than 80 times by earthquakes having a magnitude of 4 and above on the Richter scale as per the recorded history of earthquakes.
 - As per the Bureau of Indian Standards (BIS), seismic zoning maps, five districts of the State, namely Chamba (53.2%) Hamirpur (90.9%), Kangra (98.6%), Kullu (53.1%), Mandi (97.4%) have 53 to 98.6 per cent of their area liable to the severest design intensity of Medvedev–Sponheuer–Karnik scale (MSK) IX or more, means Catastrophic damage.
 - ✤ The remaining area of these districts is liable to the next severe intensity VIII or damaging zone.
 - Two districts, Bilaspur (25.3%) and Una (37.0%) also have substantial areas in MSK IX and the rest in MSK VIII. The remaining districts also are liable to intensity VIII.
- Landslides During the monsoon season and strong earthquakes, the hills and mountains of Himachal Pradesh are prone to experiencing landslides.
 - The risk is amplified by the geologically youthful and unstable steep slopes in the Himalayan ranges.
 - * In the past few decades, these slopes have become more vulnerable due to improper practices like deforestation,

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road construction, terracing, and shifts to more water-intensive agricultural methods.

- Further, the unpredictability of monsoons due to climate change and localization of rainfall, along with over construction further intensified the landslide vulnerability of the state.
- Most Vulnerable states are Kullu, Kinnaur, Kangra, Shimla, Lahaul-Spiti, Chamba.
- Avalanche Hazards The higher hills comprising the districts of Kinnaur, Lahaul & Spiti, Chamba, and Kullu are particularly vulnerable to the hazards of avalanches, and the destruction caused as a result of avalanches in the past in Himachal Pradesh though not widespread is confined to the higher reaches of the state only.
- Floods Floods are another form of natural disaster that the state experiences every year. Due to the diverse topography of the area, the flood problem in the state is largely isolated in Nature.
 - High monsoon rains in the area of the Shiwalik and lower and mid-Himalayan ranges cause extensive floods during rainy seasons.
 - In the upper reaches of the Beas and Satuj valley, the main problems are flash floods and bank erosion because of the steep slopes of rivers and high river flows due to heavy rains.
 - Recent floods in Kullu, Mandi and Kangra showed the actual vulnerability of the state from the floods, where 100s of people lost their lives and the state had to bear the loss of thousands of crores.
- Forest Fires It is one of the major hazards for the ecology and biodiversity of the state. Year by year, the incidents of the forest fires have gone up.
 - ✤ As per the data shared by Himachal Pradesh's Forest Protection and Fire Control Division with Mongabay-India, the state recorded 2,763 fire incidents from April 1, 2022, to June 30, 2022, the usual forest fire season, with an average of 31 fires per day.
- Overall Vulnerability Index Based on the vulnerability matrix, Chamba, Kinnaur, Kullu, and portions of Kangra and Shimla districts exhibit very high vulnerability to various risks.
 - Kangra, Mandi, Una, Shimla, and, Lahaul and Spiti districts are categorized as having a high level of vulnerability.
 - Hamirpur, Bilaspur, Solan, and Sirmour districts fall into the moderate vulnerability category, indicating a relatively lower level of risk.

In conclusion, Himachal Pradesh faces a complex tapestry of hazards, calling for vigilant disaster management, sustainable land-use practices, and proactive measures to safeguard both the state's environment and its residents from the perils that nature and human activities present.

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MODEL ANSWERS

1. Give an account of the various Agro-Climatic zones of Himachal Pradesh. Also, discuss about the multiple crops sown in different zones.

Himachal Pradesh, a state located in the northern part of India, boasts a diverse range of agroclimatic zones due to its varied topography and altitudinal variations.

These zones have a significant impact on the types of crops that can be cultivated and the agricultural practices that are feasible in different regions of the state.

The state can be broadly divided into several agro-climatic zones:

Sub-Tropical Low Hills Zone: This zone includes the lower altitudes of Himachal Pradesh, particularly the regions along the foothills.

The climate is relatively warm, with moderate rainfall.

Crops like maize, paddy, sugarcane, and citrus fruits (like oranges) are commonly cultivated in this zone.

Mid-Hills Zone: This is the most extensive agro-climatic zone in the state, covering a substantial portion of Himachal Pradesh.

The altitude ranges from around 600 to 1,800 meters.

A variety of crops are grown here, including wheat, barley, maize, fruits (apples, pears, plums), and vegetables (potatoes, tomatoes, peas).

Terrace farming is a common practice due to the hilly terrain.

High Hills and Valleys Zone:

- 1. This zone covers the higher altitudes of Himachal Pradesh, ranging from 1,800 to 2,500 meters.
- 2. The climate is cooler, and the growing season is shorter.
- 3. Barley, peas, and other cold-resistant crops are grown here.
- 4. Livestock rearing is also an important aspect of agriculture in this zone.

Alpine Zone:

- 1. Found at altitudes above 2,500 meters, this zone experiences cold and harsh conditions.
- 2. Limited agricultural activities are possible due to the extreme climate, but some crops like potatoes, turnips, and buckwheat are cultivated.
- 3. Animal husbandry and yak rearing are significant economic activities in this zone.

Trans-Himalayan or Cold Desert Zone:

- 1. This zone includes the districts of Lahaul and Spiti, Kinnaur, and parts of Chamba.
- 2. The altitude is extremely high, and the climate is harsh and cold.
- 3. Due to the challenging conditions, only coldtolerant crops like barley, peas, and some vegetables can be cultivated.
- 4. Traditional practices like dryland farming and terrace cultivation are prevalent.

These agro-climatic zones reflect the diversity of Himachal Pradesh's landscape and its influence on the types of agriculture that can be practised in different regions. Farmers in the state have adapted their cultivation techniques and crop choices to suit the specific climatic conditions of each zone, resulting in a rich agricultural tapestry that contributes to the economy and sustenance of the state.

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2. Critically analyze the role of the industrialisation in socio-economic development of Himachal Pradesh. Also, mention various types of industries developed in Himachal Pradesh.

After attaining statehood, concerted efforts were made for significant infrastructure development at various places in the state.

- (1) Till 2003-03, the growth rate was slow. Then PM Atal Bihari Vajpayee announced the industrial package for the state which became a growth accelerator for industrial growth.
- (2) From 7% of the contribution to state GDP in 1970, at present it is contributing 31.23% to the state's GDP.
- (3) Further it contributes around 8% in the share of employment

The role of industrialization in the socio-economic development of Himachal Pradesh has been significant, but it has come with its own set of challenges and complexities.

Here's a critical analysis of the industrialisation of the H.P.:

Positive Aspects:

(1) Employment Generation Industrialization has led to the creation of job opportunities, reducing unemployment rates and providing a livelihood for the local population.

E.g., Construction and manufacturing are two sub-sectors within the industry sector that proved the largest share of employment to the workforce employing 11.53% and 7.61% of the state's working adults respectively.

(2) Revenue Generation - The establishment of industries contributes to the state's revenue through taxes, which can be used for public welfare and infrastructure development.

E.g. From a 7% contribution to state GDP in 1970, it is contributing 31.23% to state GDP in 2021-22.

(3) Skill Development - As industries grow, they demand a skilled workforce. This encourages skill development programs and improves the overall human capital of the state.

E.g., the Himachal Pradesh Skill Development Policy (Him Kaushal), 2016, was adopted by the GOHP in June 2016 and provides a roadmap for the state's reform and growth of skill development initiatives.

(4) Infrastructure Development - The establishment of industries necessitates the development of infrastructure, including roads, transportation networks, and utilities, which benefits the region as a whole.

E.g., work on a 50 km broad gauge railway line in Himachal Pradesh between Una and Hamirpur has taken on a war ground to boost trade, industrial development and the tourism industry.

(5) Diversification of Economy - Before industrialization, Himachal Pradesh was largely dependent on agriculture. Industrialization diversifies the economy and reduces the vulnerability to fluctuations in agricultural output.

Challenges and Concerns:

(1) Environmental Impact - Himachal Pradesh is known for its pristine environment and fragile ecosystems. Industrialization can lead to pollution, deforestation, and resource depletion, posing a threat to the state's unique biodiversity.

E.g., PM2.5 concentration in Baddi is currently 9.5 times the WHO annual air quality guideline value i.e., $47.5\mu g/m^3$.

A 2019 study by environmentalists Manshi Asher and Prakash Bhandari, on the impact of hydro projects in Kinnaur's ecology, revealed that more than 11,000 trees of 21 species were cut (till 2014) to pave the way for nearly a dozen power projects

(2) Cultural Impact - The rapid influx of industries can disrupt traditional ways of life, affecting local cultures and communities. This can lead to social tensions and conflicts.

E.g., Locals in Kinnaur are protesting approvals given to new hydropower projects, which they fear will destroy the chilgoza pine, an important cash crop in the region.

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(3) Unbalanced Development - Due to the difficult terrain of Himachal Pradesh and the lack of area for industrial development, unbalanced development takes place in the region.

E.g., there are around 44000 industrial establishments in the state, most of which are concentrated in the Baddi-Nalagar-Barotiwala and Amb region of Una district.

- (4) Land Use Conflict Industrial expansion can lead to conflicts over land use, as the state has limited arable land and land is also required for other purposes such as housing and tourism.
- (5) Resource Depletion: Industries often require substantial amounts of natural resources like water and minerals. Overexploitation of these resources can lead to scarcity, affecting both industries and local communities that depend on these resources.

E.g., The state government has, since 1981, diverted more than 12,000 hectares of forests for hydropower projects, cement industries, tourism and road expansion, all ecologically destructive activities.

Types of Industries in Himachal Pradesh:

(1) Hydropower Industry - Given its abundance of rivers and hilly terrain, Himachal Pradesh has focused on developing hydropower projects. These projects not only contribute to the state's energy needs but also generate revenue through power generation.

E.g., Sawra Kuddu HEP, Sainj HEP, Parbati HEP, Renuka Ji HEP, etc.

(2) Tourism Industry - Tourism is a major industry in the state due to its natural beauty and cultural heritage. This includes adventure tourism, eco-tourism, and religious tourism.

E.g., Ski resorts, Organic Tourism, Pilgrimage Tourism, Film Tourism, etc.

(3) Agro-Based Industries - The state promotes industries based on agricultural products such as food processing, fruit preservation, and wool processing.

E.g., apple production, Kangra tea, fruit jams, spices and herbs like cardamom, ginger etc. are the part of state's agro-based industry.

(4) Textile Industry - The textile industry in Himachal Pradesh is mainly based on various skills like spinning, weaving, handloom etc. this type of craft and art has encouraged development in the places and has provided various opportunities for the local people.

E.g., Lahauli woollen gloves and socks, Kullu Shawl, Kangra Shawl, Chanba rural, etc,

(5) Pharmaceutical Industry - Himachal Pradesh is home to a significant number of pharmaceutical companies, contributing to the pharmaceutical sector of India.

E.g., The Baddi-Barotiwala-Nalagarh industrial belt in Himachal Pradesh's Solan district is among Asia's largest pharmaceutical hubs.

The belt has nearly 700 top pharma companies, including industry leaders like Dr Reddy, Torrent Pharma, Alkem Pharmaceutical, Cipla, Sun Pharma, Unichem, Glenmark, and USV.

(6) IT and ITES Industry - In recent years, there has been an effort to develop the information technology and ITenabled services sectors, particularly in cities like Shimla and Dharamshala.

Industrialization in Himachal Pradesh has boosted employment, revenue, and infrastructure, but it also poses challenges to the environment, culture, and resources. Striking a balance between industrial growth and sustainable development is essential for long-term well-being and for preserving the state's natural and cultural heritage.

3. What are the challenges presented by the relief of Himachal Pradesh in terms of infrastructure development and connectivity?

The reliefs of the H.P. pose many challenges for the infrastructure development and connectivity projects.

These challenges are:

(1) Difficult Terrain - The rugged and mountainous terrain of Himachal Pradesh makes it challenging to construct roads, railways, and other transportation networks. Steep slopes, narrow valleys, and winding roads can increase

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construction costs and time.

- (2) Landslides and Erosion The hilly landscape is susceptible to landslides and soil erosion, especially during heavy rainfall or earthquakes. This poses a risk to existing infrastructure and requires ongoing maintenance efforts.
- (3) Harsh Weather Conditions Extreme weather conditions, including heavy rainfall during monsoon and snowfall during winters, can disrupt transportation networks, making it challenging to maintain year-round connectivity.
- (4) Limited Space The mountainous terrain limits available flat land for building infrastructure, forcing planners to work with constrained areas for expansion and construction.
- (5) Disasters Natural disasters, along with human negligence, destroyed the developed infrastructure like roads, bridges, etc. which further hindered the pace of the infrastructure development and connectivity projects.

E.g., in recent destruction in the state due to heavy rainfall, the state lost around Rs.10,000 crore. Around 40 major bridges and many national highways were destroyed in this year's monsoon.

(6) Isolation of Communities - Many remote villages are located in difficult-to-reach areas due to the relief.

This isolation hampers access to essential services, healthcare, and education.

4. Write about the major rivers that flow through the state of Himachal Pradesh, and how have these rivers contributed to the state's socio-economic development

The intricate topography of Himachal Pradesh is shaped by the extensive network of significant river systems. These rivers, flowing through the state's diverse landscapes, have played a crucial role in shaping its socio-economic development.

The major rivers that flow through the state are:

- (1) Sutlej River Sutlej River The Sutlej is the longest river in Himachal Pradesh. It originates from the Mansarovar Lake in Tibet and enters Himachal Pradesh near the Shipki La pass.
- (b) It flows through the Kinnaur, Shimla, Kullu, Solan, Mandi and Bilaspur districts and then enters Punjab.
- (c) The Bhakra Dam, one of India's highest gravity dams, is constructed on the Sutlej River in Himachal Pradesh.
- (d) Main tributaries Spiti River, Baspa River, Gambahr River, etc.
- Beas River: The Beas River originates near Rohtang Pass (Beas Kund) in the Pir Panjal range.
- (b) It flows through Kullu Valley, Mandi, and Kangra districts, making it an important river for agriculture and hydroelectric power generation.
- (c) The Beas River eventually flows into Punjab and merges with the Sutlej River at Harike.
- (d) The famous Pong Dam is established on the Beas River in Kangra district.
- (e) Main tributaries Parbati River, Sainj River, Banganga, etc.

Chenab River: The Chenab River originates from the Bara Lacha Pass in the Lahaul and Spiti districts of Himachal Pradesh. It's formed by the confluence of two major streams, the Chandra River and the Bhaga River at Tandi.

- (b) It flows in the Lahaul-Spiti district and then enters the Pangi valley of Chamba district near Bhujind and leaves the district at Sansari Nala to enter the Podar valley of Kashmir.
- (c) It flows in Himachal for 122 km.

Ravi River - Ravi originated at the Bara-Banghal area of Kangra district at an elevation of 5000 meters.

- (b) It is fed by the Bhadal and Tat Gari glaciers,
- (c) It flows through the Kangra and Chamba districts.
- (d) It leaves H.P. to enter Kashmir at Kheri.
- (e) Main tributaries Bhadal River, Siul

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River, Baira, etc.

Yamuna River - Yamuna originated from the Yamunotri glacier at Bunderpunch range in Uttarakhand.

(b) It enters Himachal at Khadar Majri in the Sirmaur district and leaves Himachal near Tajewala.

Main Tributaries:(1)Giri River – It arises from Kuper Peak, just above Jubbal town in Shimla district. It divides the Sirmaur district into two equal parts known as the Cis-Giri and Trans-Giri regions.

- (2) Tons River It originates as two feeder streams, the Rupin and the Supin Rivers, which meet at Natiwar to form Tons. It joins Yamuna at Kalsi near Dehradun.
- (3) Bata River It arises near the Dharati range and joins Yamuna at Bata Mandi.

The contribution of these river systems to Himachal Pradesh's socio-economic development is substantial:

- (1) Hydropower Generation: About 27,436 MW of hydroelectric power can be generated in the state by the construction of various hydroelectric projects on the five perennial river basins. Out of the total hydroelectric potential of the state, 10,519 MW is harnessed so far.
- (2) Irrigation: Major irrigation projects are;
- (1) Shah Nehar Irrigation project This is the only major irrigation project in the state, situated in the Kangra district. It provides irrigation facilities to 15,278 hectares of land in the region.
- (2) Other minor irrigation projects are Sidhata IP (Kangra), Changar IP (Bilaspur), Balh Valley Left Bank IP (Mandi), etc.
- (3) Water Supply: The rivers serve as sources of freshwater for domestic, industrial, and agricultural use, catering to the needs of both rural and urban populations.
- (4) Tourism: E.g., The Asian Rafting Marathon was decided to be held in the Beas River near Nadaun in September 2023, but delayed due to heavy destruction in the state.
- (5) Transportation: E.g., at present the activities of water transport are operational only at four chief water bodies in the state.

They are Pandoh Lake (on the Beas River) of district Mandi, Gobind Sagar Lake (on the Satluj River) of Bilaspur district, Chamera lake (on Ravi) of Chamba district and Kangra district's Pong Lake (on Beas).

(6) Economic Growth: E.g., The commercially important fish species in Govind Sagar Lake, Pong Dam Reservoirs, Chamera Lake and Ranjit Sagar Dam have become a tool for the upliftment of the local population

About 5,567 fishermen in the state depend directly on reservoir fisheries for their livelihood.

In essence, Himachal Pradesh's rivers are not merely geographical features but dynamic contributors to the state's progress. The challenge lies in harnessing these resources sustainably, ensuring their continued benefits for generations to come while safeguarding against potential risks.

5. Define the concept of Climatic zone and throw a light on climatic zone in Himachal Pradesh.

A climate zone is a area or region distinguished from a neighbour by a major physical climatic characteristic that is of global scale. Climate zones are bounded by limits that parallel lines of latitude to form "belts" that mostly extend around the globe; the word "zone" is actually derived from the Greek word meaning belt, and it is from classical Greek times that the concept of zones is derived.

Climatic zone is effect of various elements weather and climate is Homogeneous in sharp contrast to adjoin areas which differs significantly.

Himachal Pradesh can be divided in following climatic zones .

1. The lower tropical and subtropical climate region: Prevails in southern and south western and western part of state.

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The average summer temperature in southern foothills is about 30 degree Celsius and average winter temperature is around 18 degree Celsius.

- 2. This climate region is further divided into tropical climate and subtropical climate.
 - A. Tropical Climate: Prevails in southern, western foothills of Shivalik lower Himalayan ranges. Paonta-Amb areaof Sirmaur, Nalagarh of Solan, Changar, whole Una, Nurpur of Kangra district fall in these climatic regions.

Seasonally high rainfall, have hot summer and pleasant winters.

B. Subtropical Climate: Mainly found on lower Himalayan ranges and valleys up to an elevation 1500 m.Chamba, Kangra, Hamirpur, Bilaspur, Una, Solan and Sirmaur district are come under this zone.

It has relatively less hot summers and cool winters.

Summer month's temperature range 20-30 degree and 15 to 20 degree Celsius in winter month.

2. The middle temperate climateRegion:

The Region has its existence in middle and upper parts of state. This climate zone includes greater part of Chamba, Kangra, Mandi and whole of Shimla and Kullu district.

Here the amount of rainfall varies from 100 to 200 cm but intensity goes on decreasing with increase in elevation toward great Himalayan range.

The entire zone is characterized with temperate climate and mild summers and cool winters.

The summer temperature here ranges between 10 to 20 degree

Celsius and 8 degree Celsius to below freezing point in winters.

Depending up on intra-regional variation in the climatic conditions it is further divided into.

Wet Temperate Climate: Mainly confined to wet mountain slopes Dalhousie, Dharamshala, Kangra and Palampur.

The summer area pleasant here and range found between 15 to 20 degree Celsius.

Dharamshala is most rains/wettest place in Himachal Pradesh lies in this climatic zone.

B) Moist wet temperate climate: dominate in Shimla, Kotgarh, Narkanda, Kullu, Chamba area of state, lying in altitudinal zone 1500 to 3500 m.

The climatic conditions in this climate changes very quickly.

Temperature lies here 10 to 16 degree Celsius and rainfall 100 to 250 cms.

This climatic region also known as cools humid temperate zone.

Cloud bust is also active in this region.

3. The Higher Alpine-Climatic Region: Remain under snow for about 5 to 6 months.

The whole Lahaul-Spiti, Pangi and Bharmaur area of Chamba and whole of Kinnaur district are market with such climatic set up.

This part of Himachal lying in rain shadow part of the GreatHimalayas and Pir Panjal ranges further divided into 2 regions due to intra zonal differences.

- **A.** Sub Alpine Climate: is commonly lying in rain shadow zone and thus arid condition prevails. This zone is also known as cloud high mountain zone.
- **B.** Alpine Climate and Freeze Arctic Zone: The upper reaches of whole Lahaul-Spiti, Pooh area of Kinnaur and Pangi area of Chamba are marked with in climate.

All glaciers of Himachal Pradesh are found in these climatic regions.

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Avalanches, Landslides, falling of rocks are some of climatic hazards of this climatic group.

These climatic zones are treasure for Himachal Pradesh and make sate rich in biodiversity, forest cover, and required climatic conditions for agriculture, horticulture, pisciculture and Rich in many other natural sources.

6. Define 'doon valleys' and give example of doon valley in Himachal Pradesh

Duns are longitudinal valleys created when the Eurasian plate and the Indian plate collided as a result of folding. Among lesser Himalayas and shiwaliks, they are formed.

- (1) Shiwalik Hills were formed by the accumulation of conglomerates (sand, stone, silt, gravel, debris etc.)
- (2) These conglomerates, in the initial stages of deposition, obstructed the courses of the rivers draining from the higher reaches of the Himalayas and formed temporary lakes.
- (3) The conglomerates were well settled at the bottom of the lakes.
- (4) When the rivers were able to cut their courses through the lakes filled with conglomerate deposits, the lakes were drained away leaving behind plains called 'duns' or 'doons' in the west and 'duars' in the east.
- (5) In Himachal Pradesh Kyar-da-doon and Nalagarh doon are best example of doon valley.

7. Comment on Urban development in HP since colonial period.

Cities appear as a major role player in the economy of any area reflecting the global integration of its economy as they house majority of large business groups. Himachal Pradesh is a hill state with some of the most difficult terrains of the country. Since Colonial period Himachal has always been a least urbanized state of India.

- (1) The First Urbanization took place with the advent of Gurkhas where they created forts at the strategic locations which were further captured by Britishers and were converted into town.
- (2) During British time the Urbanization took place mainly on the hill stations where climatic conditions was somewhat similar to their native countries or the forts of Gurkhas like Subathu etc. hence cantonment areas were set up at Dagshai, Dharamshala along with development of town of Shimla. Consequently, due to the summer capital made by Britishers at Shimla the Railways and roadways also developed, it took the shape of town.
- (3) In 1901 urban population of Himachal Pradesh was 77332 persons which was merely 4.03 percent of the total population of the state.
- (4) The period of 1901-11 marked a negative urban growth of 23.46%. It is evident that en-tire colonial period was characterized by very slow urban growth.
- (5) The process of urbanization speeded only after independence however the most prominent growth has been noticed between 1941-51. It was largely due to the formation of Himachal Pradesh which gave birth to new small towns.
- (6) According to 1971 census there were only 36 towns in Himachal Pradesh. Shimla is the only one town andmaintained its position.
- (7) In 1971 the small towns like SunderNagar, Mandi, Nahan, Chamba witnessed a very high growth rate due to migration of large population.
- (8) Similarly new town Paonta came in top 10 due to industrialization and border towns developed around these industrial centres like Baddi Pramanoo, Nalagarh and Amb ect .
- (9) Now a days urban development is taking place due to tourism like Manali and relgion town for example Jwalamukhi and Naina Devi ect.

Challenges

- (1) A majority of cities in Himachal Pradesh face hard challenges related to housing, transport, electricity, water supply, pollution, and congestion.
- (2) There is increased threat of crime in the urban cities .

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(3) The natural spread of unchecked, unplanned and haphazard growth of urban areas is the growth and spread of slums.

The government of Himachal as well as India launched various schemes to deal with the challenges

- (1) Town and country planning act: it is responsible for planning in the urban centres.
- (2) Smart city Mission: Its Objective to develop 100 cities citizen friendly and sustainable under 8 approaches and 4 objectives. In Himachal Shimla and Dharmshala are brought under this scheme.
- (3) Swach Bharat Mission (Urban) : Swachh Bharat Mission (Urban) is a flagship Programme of Government of India and being implemented in all statutory towns by Ministry of Housing Affairs , Government of India.

The main aim of Swachh Bharat Mission is to make cities/towns open defecation free and provide a healthy and livable environment to all.

- (4) Pradhan mantri awas yojna Urban: Government will provide shelter to the slum dwellers.
- (5) Lakshay :- This scheme will provide wage employment in the areas of municipal council and corporation.
- (6) "Mukhya Mantri Shahri Ajeevika Guarantee Yojana": Under this scheme Government will ensure livelihood security to urban households by providing a guaranteed employment for 120 days
- (7) Atal Mission for Rejuvenation and Urban Transformation (AMRUT) :- Shimla and Kullu have been included under this mission.

The trends of urbanization shows that the growth of Urbanization is very low in the state. There is only one class –I town in the state and other number of towns have been stagnant in the state. The rapid growth of urban population both natural and migration towards Shimla has put a tremendous pressure on public utilities like housing, Sanitation and other though this pressure of migration is easing out as new cities are also being developed.

8. HP is prone to man-made and natural disaster, Discuss the disaster profile of state. What steps has been taken by government in disaster management?

The Disaster Management Act of India defines disaster as: "A catastrophe, mishap, calamity or grave occurrence in any area arising from natural or man-made causes or by accident or negligence, which results in substantial loss of life or human suffering or damage to and destruction of property or damage to, or degradation of environment and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area."

Difference Between Hazard and Disaster: A hazard is any phenomena that has the potential to cause destruction to life and property. A hazard become a disaster when the potential to cause de- struction is fulfilled. When there is harm to life and property of humans, the hazard is termed a disaster.

Why Himachal is Prone to Disaster

- (1) Geology Of Himachal: Geologically Himachal is located in the lap of Himalayas which is changing its topography as its young this leads to many natural hazards and then disasters.
- (2) Climate Change Effects: Climate change place a vital role in the conversion of Hazard into disaster. It leads to flash floods etc.
- (3) Vulnerable due to tourists: Tourists also cause disaster like the stampede caused in Naina Devi and Spreading of COVID-19.
- (4) Over Population: Cities of Himachal poses a threat to the environment due to overcrowding and unregulated construction and infrastructure development which can lead to land slide and other disasters.
- (5) Other Man-Made activities: Due to damsand other roads building etc, the mountains are vulnerable to landslides.

Hazard profile of State: - State of Himachal is prone to various hazards both Natural and man made and other disasters.

Other Man-Made activities: Due to dams and other roads building etc, the mountains are vulnerable to landslides.

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Hazard profile of State: - State of Himachal is prone to various hazards both Natural and man made.

	-			
lydro Meteorological	Geological	Industrial	Man - Mede	Biological
Flash Floods	Earthquakes	Chemical	- Accidents	Epidemic
Cloud Bursts	Land Sides	Industrial	Building	Pandemics
 Forest Fires 	- Sol Erosion		Collapse	CBNR
Droughts			Terrorism	Emergency
Hal Storms			-Boat Capsizing	Pest
Wind Storms			- Stampede	
Lightening			Domestic Fires	
Avalanche				

Natural Disaster

(1) Earthquake: Himachal Pradesh falls under seismically active regions of the world and has experienced earthquakes in the past. The region has also experienced tectonic movements which are evident from the several thrusts and faults present around the region.

Districts Kangra, Hamirpur and Mandi fall in very highly vulnerable category, districts which fall in high earth quake vulnerability include Chamba, Kullu, Kinnaur and part of Kangra and Shimla, whereas the moderate and low vulnerable districts are Una, Bilaspur, Sirmour, Solan, Shimla and Lahaul-Spiti respectively

- (2) Landslide: Hills and mountains of Himachal Pradesh are liable to suffer landslides during Monsoon and also in high intensity earthquakes. The vulnerability of the geologically young and not so stable steep slopes in the various Himalayan regions has been increasing at a very rapid rates due to human activities. The main areas which are vulnerable are Chamba, Kullu, kinnaur and part of kangra and Shimla districts.
- (3) Floods: Intermittent heavy rains now occur in most parts of Himachal Pradesh in monsoon season, triggering Land slide and disrupting normal life in many areas of the state.

These floods poses a serious threat to the life and property of the people living in Chamba, Kullu, Una and Kinnaur falls in High vulnerable districts.

- (4) Cloud Burst: It's an extreme amount of precipitation in a short period of time some time accompanied by hail and Thunder, which is capable of causing flush flood. Himachal Pradesh is prone to such disaster during Monsoon season and could reach to breach in 249 glacial lakes in the state. It leads to gushing of water down the mountain slope together with debris like it happened recently in Dharamshala.
- (5) Forest Fire: The forest of Himachal Pradesh is rich in Vascular flora which forms the conspicuous vegetation cover. More than 95% of the species are endemic to Himachal and characteristic of western Himalayan Flora, while 5% are exotic introduced over the last 150 years. The fire causes destruction of rich Flora and Fauna of the state
- (6) Man-made Disaster
- (1) Road Accident: The Himachal is well connected through roads and vulnerable to the accident as traffic is increasing and road are curvy. There is also threat of other accident which include capsizing of boats at reservoir like pong and pandoh
- (2) Stampede: Himachal is known as land of Gods and many famous temples are located in the state like Naina devi , Jwala ji etc. in 2008 a stampede occurred in Naina Devi which killed more than 150 people.
- (3) The overall vulnerability of the state suggests that the District Chamba, Kinnaur Kullu and Part of Kangra Shimla fall in Highly vulnerable risk status and the district Kangra Mandi Una Shimla and Lahaul Spiti falls in very highly vulnerable risk.

Whereas Hamirpur, Bilaspur, Solan and Sirmaur falls in moderate vulnerable risk status.

Steps taken by Himachal Government Disaster management.

- (1) Formulation of State and District Disaster management Authority. These authorities are the outcome of Disaster management act 2005. The SDMA is headed by respective Chief Minister where as DDMA is headed by Deputy Commissioner of the concerned district.
- (2) Use of Geo Information system: Himachal government is using high endtechnology to predict the disaster well in time this will save the lives of many people. It's carried out through Aryabhatta Geo-informatics & Space Application Centre.

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(3) Early warning system in the areas where risk is high. Like during Floods and monsoon tourists are warned through messages and oral announcements.

(4) Development of District Disaster Management Plan

Himachal government developed a vision under SDG goal no 1 which is to be Achieved by 2022. Minimizing the causalities, preferably no causalities, due to climate-related extreme events and other economic, social and environmental shocks and disaster.

- (5) Setting up of Himachal Pradesh State Data Centre To keep the Government applications / websites running in the event of a power outage, natural disaster or any other disruption, a disaster recovery (DR) site of HP State Data Centre has been setup.
- (6) High-tech state-of-the-art Command and Control Centres are proposed to be setup in Shimla and Dharamshala with the aim to ensure convergence of various citizen services and ICCC would be utilized to capture data pertaining to various citizen centric services in real time manner and provide useful information to the public using One City One App, provide emergency as well as disaster management services to the citizen.

Conclusion: Himachal has very vulnerable geographic profile therefore it must be understood that Proper planning and mitigation measures can play a leading role in risk-prone areas to minimize the worst effects of hazards.

All development activities must be carried out while keeping in mind hazard and disaster profile of the sate and Environment Impact Assessment must be mandatory in order to ensure sustainable development. Similarly with the changing threats of disaster like COVID the health system of the state and other dependable are to be kept alert so that the casual.

9. Put a light on economic importance of river Sutlej of Himachal Pradesh

- 1 It is largest among the five rivers of Himachal Pradesh. It enters Himachal at Shipki district Kinnaur. It is important for state in following manners:
- 2. **Human settlement:** The prominent human settlements that have come on the banks of Sutlej river are Namgia, Kalpa, Rampur, tatapani Sunni and Bilaspur.
- 3. Agricultural values: A long valley formed by the Sutlej river form Shipki la to Bilaspur.In Bilaspur Chaunto valley near Bhakra dam is flat and fertile land.
- 4. Hydro projects on Sutlej: Nathpa Jhakri 1500 MW, Bhakra 1325 MV, Baspa-II 300 MW etc.
- 5. Fisheries: dam on this River Sutlej and artificial river are famous for fisheries and aquaculture. The reservoir of Himachal Pradesh has the distinction of highest per hectare fish production in Govind Sagar on river Sutlej.
- 6. Tourism: The Sutlej circuit passes through snow covered majestic Himalaya's forest and pines, oak and deodar, apple orchards and through shivalik foothills which attracts tourists and pave the way for eco-tourism in Himachal Pradesh.
- 7. Irrigation: Many small and medium irrigation projects are started by Himachal government on river Satluj in Mandi, Shimla, Solan etc.
- 8. Cultural and religious: In tatapani of Karsog valley of Mandi district people comes to have holy dip into river Satluj on the festival of Makar Sakranti. HP Tourism Cooked 1100 kg 'Khichari' at Tattapani to Promote Tourism.

10. Provide an overview of the glaciers of Himachal Pradesh.

A glacier is a large, perennial accumulation of crystalline ice, snow, rock, sediment, and water that originates on land and moves downslope under the influence of its own weight and gravity.

- (1) They are sensitive indicators of changing climate.
- (2) Glaciers are called "Shigri" in the local language of Himachal Pradesh.

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Statistics of glaciers in Himachal Pradesh:

- (1) There are around 1239 glaciers present in Himachal Pradesh.
- (2) On the basis of the basin-wise distribution of the glaciers in Himachal Pradesh, the largest numbers of glaciers in Himachal Pradesh (52.4%) are within the Satlujbasin, followed by Chenab (14%), Beas (13.3%) and Ravi (12.8%).
- (3) The largest number of glaciers in terms of their type is mountain glaciers (70.7%), followed by basin glaciers (12.7%) and valley glaciers (9.7%).
- (4) The highest elevation of glacier origin varies between ~ 6600 meters to ~ 4200 meters above sea level, and the lowest terminal point for these glaciers varies between ~ 6300 meters to ~ 3600 meters.

The famous glaciers of the Himachal Pradesh:

- (1) Bada Shigri Situated in Lahaul-Spiti, it is the largest glacier in the state.
- (2) It fed to the Chandra River.
- (3) Chandartal Lake was formed due to the large destruction caused by the glacier in 1938.
- (4) Lady of Keylong The Lady of Keylong Glacier was named by English Lady Alshinde.

(a) The height of the Glacier is 6061 metres above sea level.

- (b) When some slow mats the shape of this cliché appears like a woman carrying a load on her back.
- (5) Geyphang Glacier Geyphang Glacier is named after Gefang, the famous deity of Lahore. The peak of the Geyphang glacier is similar to the Matterhorn peak of Switzerland, hence also called the Matterhorn of Himachal Pradesh.
 - (b) It is also known as Mani Mahesh of Lahore.
 - (c) Miyar Glacier It is located in the LahaulSpiti.It is the source of the Miyar River which is the tributary of the Chenab River.