



Class: VII
**Subject: Social
Science**
Chapter: 3
Climates of India

The Big Questions



What makes India's climate so diverse?



What are the monsoons? How are they formed?



What is the effect of climate on economy, culture and society?

Weather and Climate



- **Weather** is the condition of the atmosphere at a specific time and place (e.g., rain, sunshine, wind), and it changes frequently.
- **Climate** is the average pattern of weather in a region over a long period (several decades).



Seasons

Seasons (spring, summer, monsoon, autumn, winter) are caused by the Earth's movement around the Sun.

Seasons affect both weather (e.g., hot in summer, rainy in monsoon) and climate, as the recurring seasonal patterns are part of a region's climate.

Most places have four main seasons, but India also has a unique monsoon season.

Types of Climates in India

Alpine (Himalayas): Very cold winters, cool summers; snowy.

Temperate (hill regions): Mild summers, moderately cold winters; popular hill stations.

Subtropical (northern plains): Hot summers, cold winters; major wheat-growing region.

Arid (Thar Desert, west): Very hot days, cool nights, minimal rainfall.

Tropical Wet (western coast): Heavy monsoon rains; good for rice and spices.

Semi-Arid (Deccan Plateau): Hot summers, mild winters, moderate rainfall.

Tropical (eastern & southern India): Mild winters, distinct wet and dry seasons due to monsoons.

Factors Determining the Climate



LATITUDE



ALTITUDE



PROXIMITY
TO THE SEA

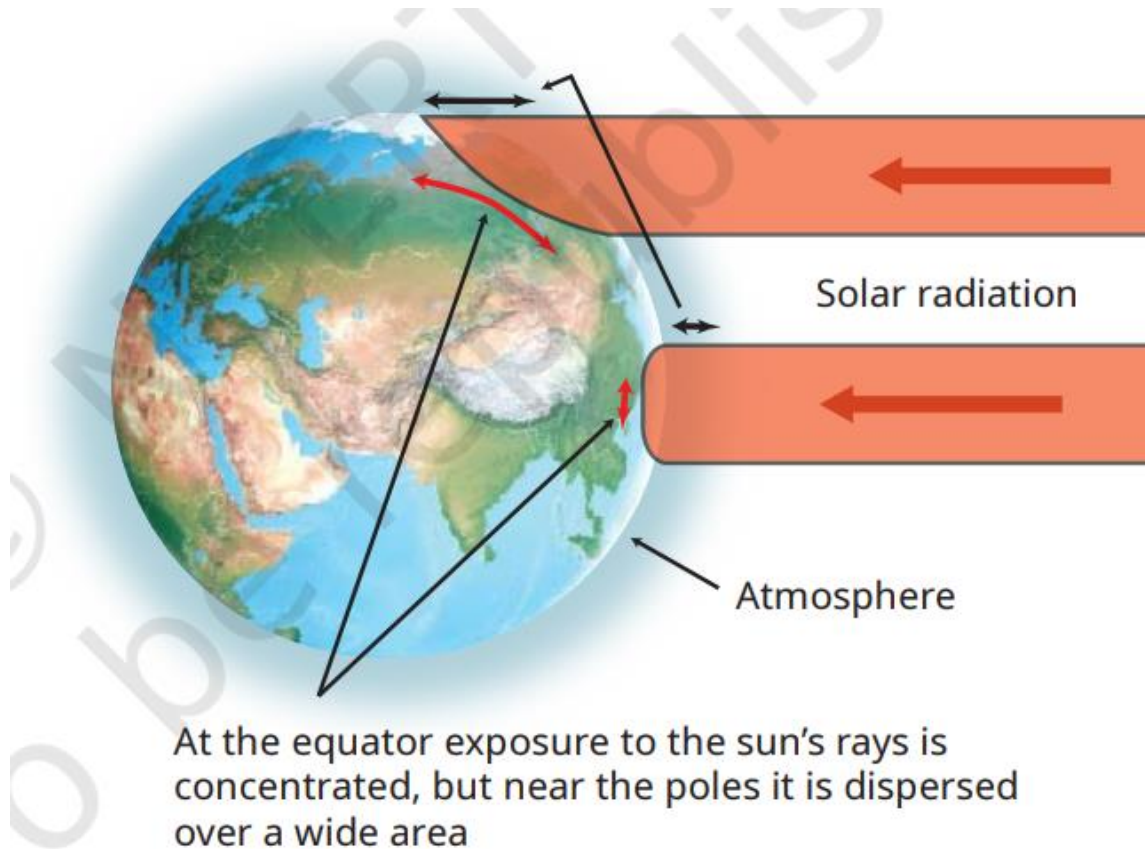


WIND



TOPOGRAPHY

Latitudes



- **Effect of Latitude on Climate**
- Places near the **Equator** are **warmer** due to direct sunlight.
- **Polar regions** are **colder** as sunlight is slanted and spread out.
- In **India**, **Kanniyakumari** and the **Nicobar Islands** are warm year-round, while **Srinagar** is much cooler due to its northern location.

Altitude

- **Higher altitude = cooler temperatures.**
- As **altitude increases**, **air pressure and density decrease**, making the air cooler.
- The **Sun heats the Earth's surface**, so the higher you go, the less heat reaches the air.
- That's why **hill stations** like **Ooty, Shimla, Darjeeling**, etc., are cooler than the plains.
- Very high places like the **Himalayas** stay cold enough for **snow** all year.



Darjeeling



Udhagamandalam (Ooty)



Munnar



Shimla

Proximity to the sea

- Coastal areas have **mild temperatures** due to the **sea's moderating effect**.
- **Land heats and cools faster** than water, causing more **extreme temperatures inland**.
- Example: **Mumbai** (near the sea) has a small temperature range ($\sim 14^{\circ}\text{C}$), while **Nagpur** (inland) has a much larger range ($\sim 34^{\circ}\text{C}$).

Summer

Incoming heat from the Sun



44°C (warm)

32°C (cool)

Coastal region cooled by sea air

Sea absorbs heat slowly

Land absorbs heat quickly

Winter

Outgoing heat from the Earth



10°C (cold)

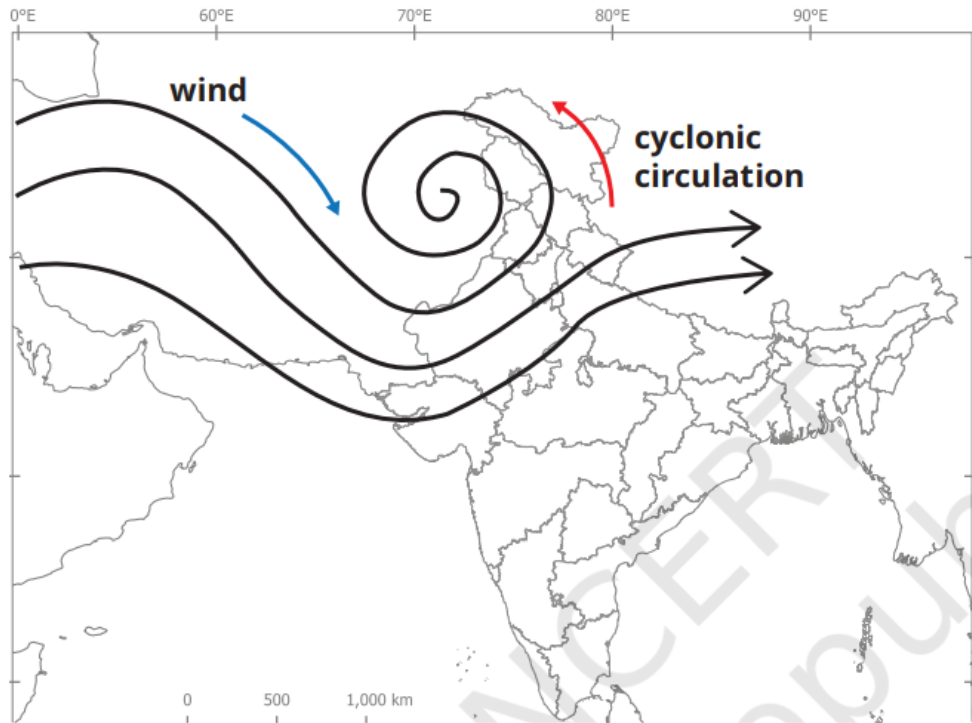
18°C (cool)

Coastal region warmed by sea air

Sea loses heat slowly

Land loses heat rapidly

Winds



- **Winds** carry **hot or cold air**, affecting temperature.
- **Hot, dry winds** from the west cause **heat waves** in states like **Punjab, Haryana, Rajasthan, and Madhya Pradesh**.
- **Cold winds** from the Himalayas cause **cold waves** in winter.
- **Winds also affect humidity**—**dry winds** reduce it, while **sea winds** bring **moisture** and can cause **rainfall**.
- Example: **Monsoon winds** bring rain from the sea.

Topography

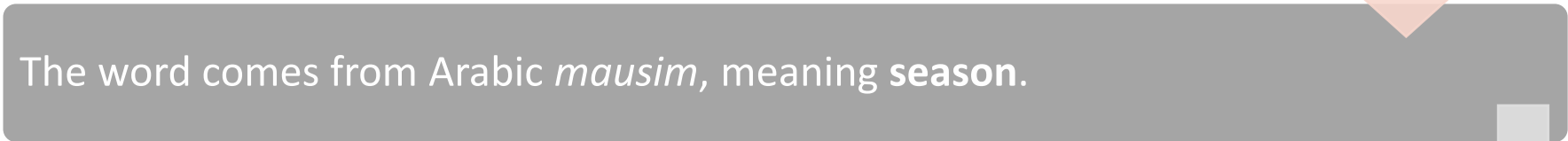
- **Topography** (land features) affects climate.
- The **Himalayas** and **Karakoram ranges** block cold winds from Central Asia.
- Flat areas like the **Thar Desert** are exposed to hot, dry winds.
- Features like the **Western Ghats** also influence rainfall patterns.
- Overall, **climate** is shaped by **temperature, precipitation, wind, latitude, altitude, proximity to sea**, and **topography**, studied over **30+ years**.

Monsoons

Monsoons are seasonal winds, key to **India's** agriculture and rivers.

A horizontal orange box with rounded corners. A light red arrow points downwards from its right side towards the next box.

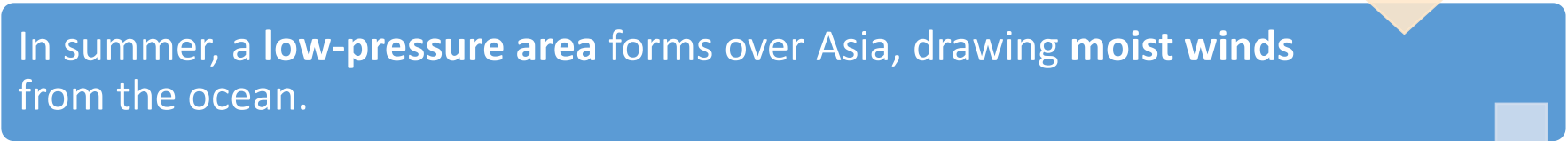
The word comes from Arabic *mausim*, meaning **season**.

A horizontal grey box with rounded corners. A light grey arrow points downwards from its right side towards the next box.

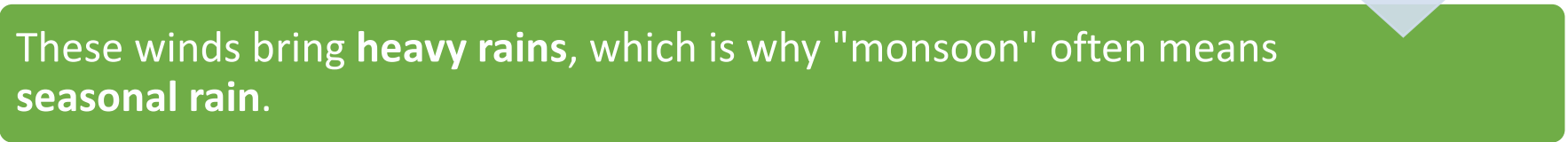
Caused by the **land heating faster** than the ocean.

A horizontal yellow box with rounded corners. A light orange arrow points downwards from its right side towards the next box.

In summer, a **low-pressure area** forms over Asia, drawing **moist winds** from the ocean.

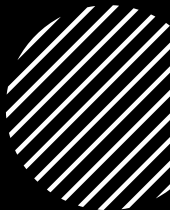
A horizontal blue box with rounded corners. A light blue arrow points downwards from its right side towards the next box.

These winds bring **heavy rains**, which is why "monsoon" often means **seasonal rain**.

A horizontal green box with rounded corners. A light green arrow points downwards from its right side.



Summer & Winter Monsoon



Summer Monsoon: Winds blow from the **ocean to the land**, bringing **heavy rains** to India.



Rains start in **June** from the south and move north by **mid-July**.



Western Ghats get heavy rainfall, while the **Deccan Plateau** gets less.



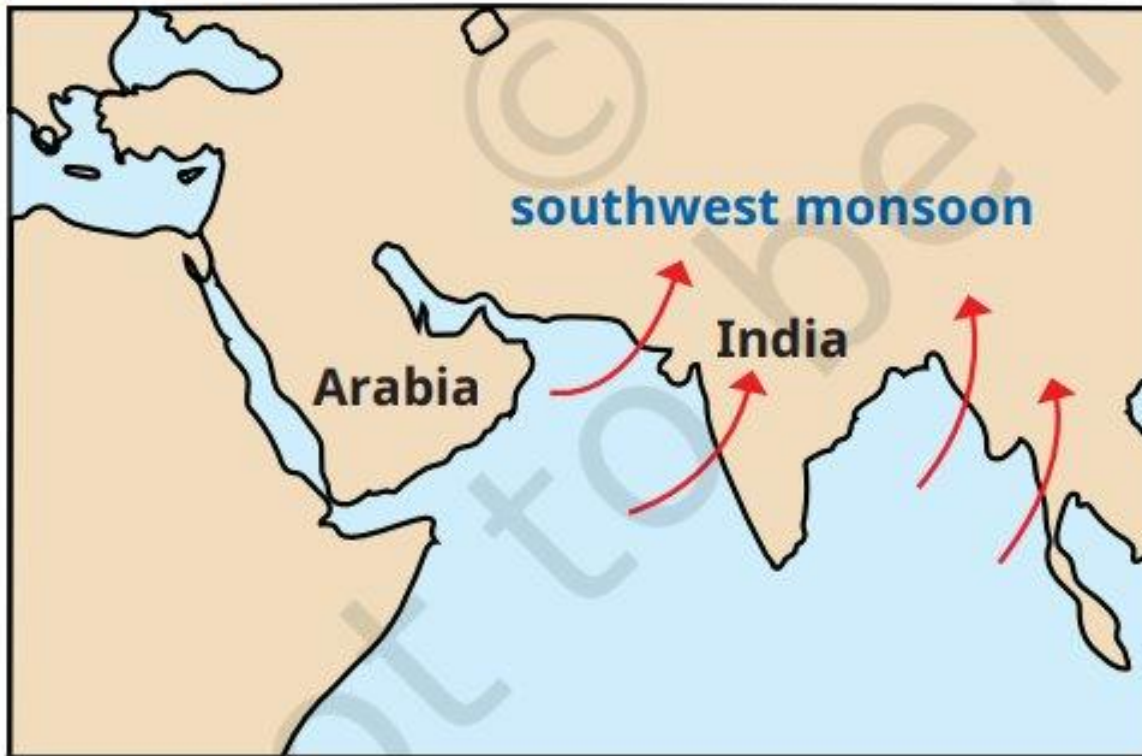
Winter Monsoon: Winds reverse, blowing **from land to ocean**, bringing **dry conditions**.



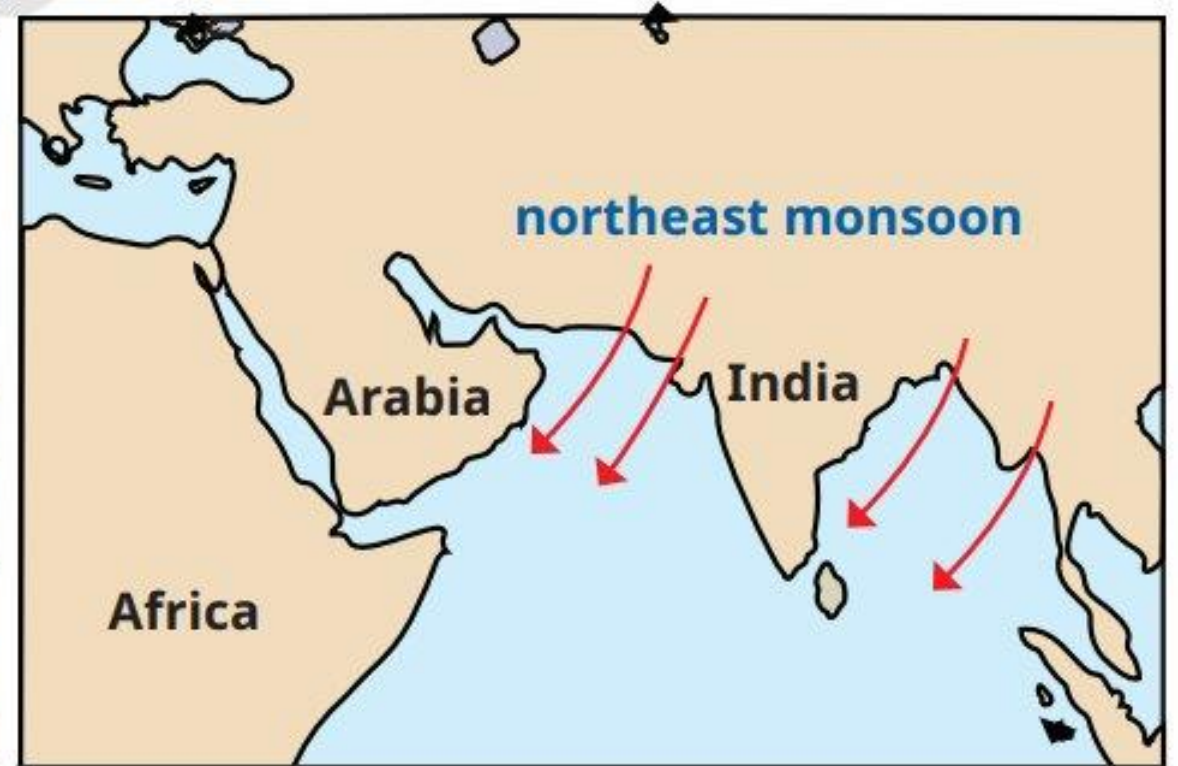
Some winds pick up moisture from the **Bay of Bengal**, bringing **rainfall** to parts of **east and south India**.

Summer & Winter Monsoon

A. Summer



B. Winter



Climate and our Lives

Climate affects **local cultures**, with festivals tied to seasons and agricultural cycles.

Monsoon failure (poor rainfall) harms **agriculture**, causes **water shortages**, and leads to **migration** of workers to cities.

This results in **higher food prices** and economic stress.

Industrial activities also rely on predictable weather and water availability.

Climate disasters can further strain **socioeconomic conditions**.

Climates and Disasters

India's diverse weather patterns can bring about extreme conditions such as cyclones, floods, landslides and other such climate-related disasters.



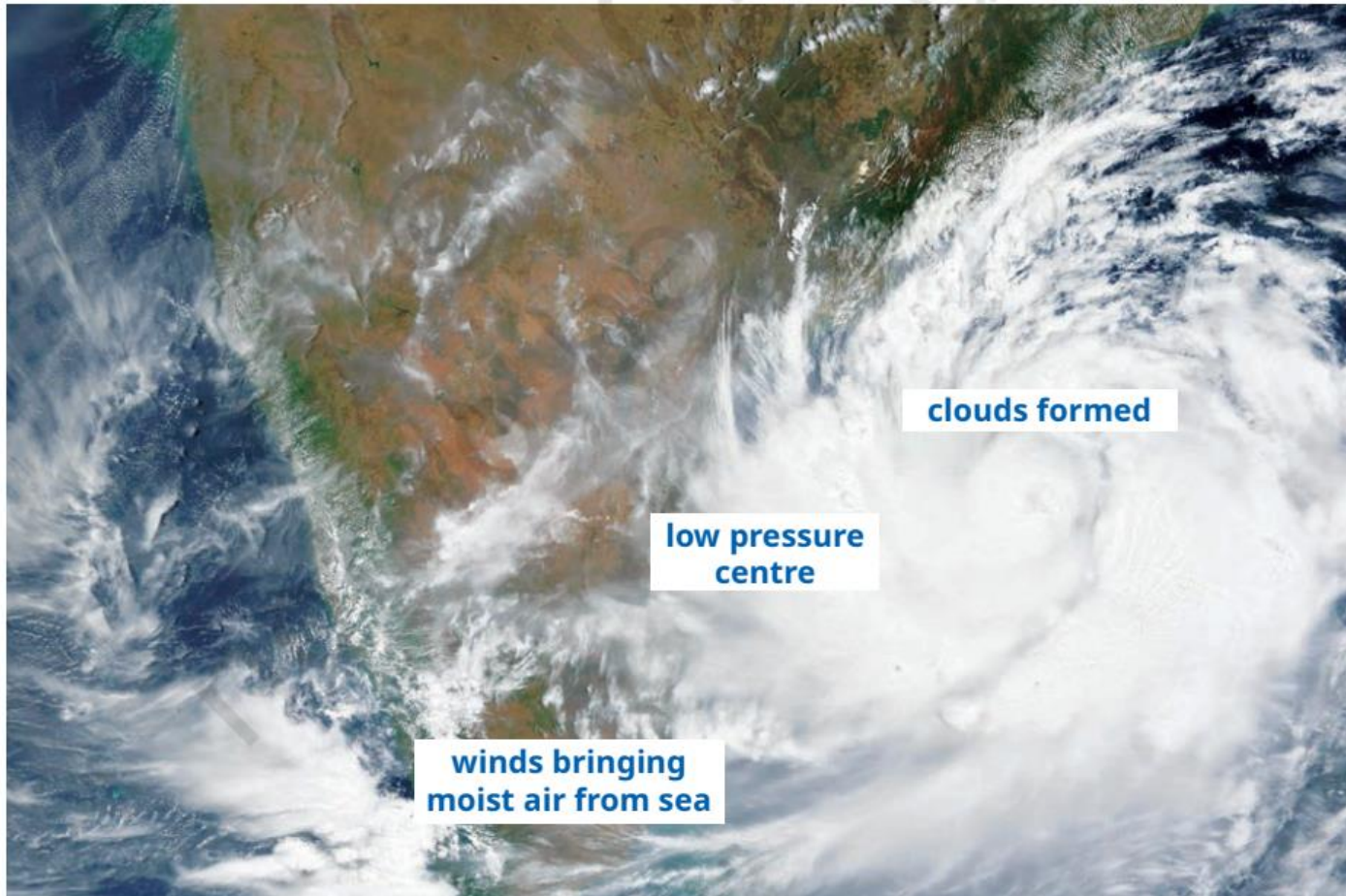
These events affect people's lives, disrupt agriculture, damage infrastructure and disturb local economies.



NDRF

- The National Disaster Response Force(NDRF) is specially trained to respond to natural as well as human-made disasters.
- NDRF battalions are located at 12 different locations in India.
- The NDRF has played a key role in rescue and evacuation during disasters like cyclones, landslides and floods.

Cyclones



- The **eastern coastline** of India experiences **several cyclones** each year.
- Cyclones can be **destructive**, causing loss of life, property damage, **soil erosion**, and uprooting trees.
- The **India Meteorological Department (IMD)** monitors and provides information on **cyclone formation, evolution, and landfall**.

Cyclones



Fig. 3.14. Eye of the storm

Flood



Floods

- **Floods** occur when **water overflows** into normally dry land due to heavy rainfall or excess water in rivers and lakes.
- They are common during the **monsoon season** in states like **Uttar Pradesh, Bihar, Kerala, Andhra Pradesh, and Assam**.
- In the **Himalayas**, floods happen when **glacial lakes** overflow due to **melting glaciers** or heavy rainfall, causing **glacial bursts**.
- **Urban floods** can occur due to **overburdened drainage systems, poor construction** blocking waterways, and **impervious surfaces** like concrete that prevent water absorption.

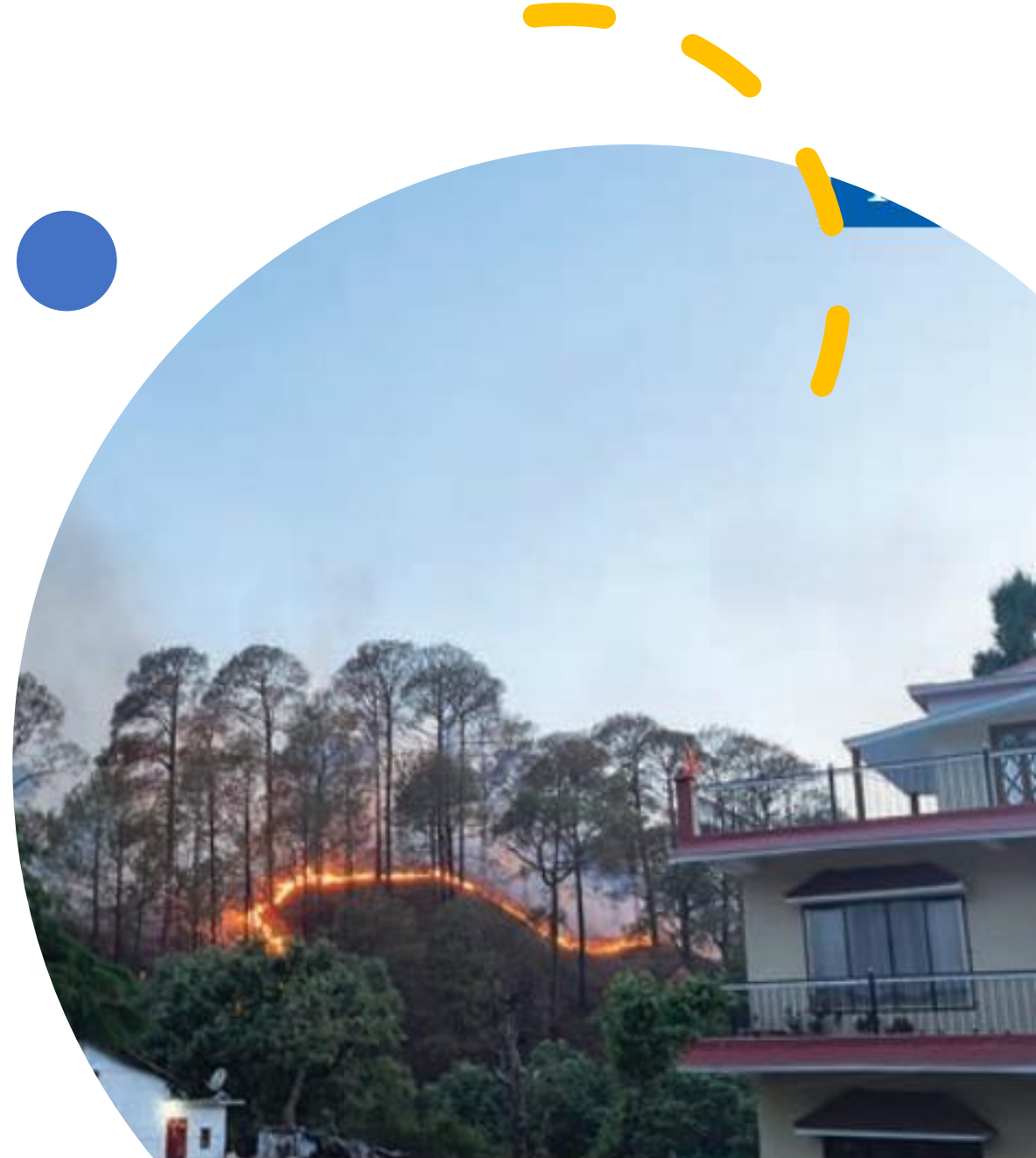
Landslide



- A **landslide** is the sudden collapse of **rock, soil, or debris**, often triggered by **heavy rain, earthquakes, or volcanic activity**.
- Common in **hilly and mountainous regions** like **Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh**, and the **Western Ghats**, especially during the **monsoon**.
- Human activities like **deforestation, improper construction, and blocking water flow** increase the risk of landslides.

Forest fires

- **Forest fires** are uncontrolled fires that spread quickly, often fueled by **dry conditions, droughts, high winds,** or **human carelessness**.
- Common in states like **Uttarakhand, Himachal Pradesh, Madhya Pradesh, Chhattisgarh,** and the **Western Ghats**.
- They destroy **forests**, harm **wildlife**, degrade the **ecosystem**, worsen **air quality**, and displace **local communities**, leading to both **environmental** and **economic** consequences.





Climate change

- **Climate change** refers to long-term changes in **temperature, precipitation, and weather events**.
- While natural processes caused climate change in the past, **human activities** (like burning **fossil fuels, deforestation, and harmful industrial practices**) are now the primary drivers since the **19th century**.
- The burning of fossil fuels releases **greenhouse gases** (like **CO₂**), which trap heat and cause **global warming**.
- This rapid warming disrupts **climate patterns**, affecting **ecosystems** and **human societies**.

Climate change

- **Rising temperatures** in India are noticeable, with the **average temperature** in early 2025 being **1 to 3°C above normal**, leading to **shorter, milder winters**.
- This affects **agriculture** and **small-scale industries**.
- Addressing **climate change** helps in **disaster preparedness** and promotes **environment-friendly practices**.
- Measures like **reducing greenhouse gas emissions**, **planting trees**, **renewable energy**, and **sustainable lifestyles** are essential but often clash with **economic growth** and **increased consumption**.



Test your knowledge



What is the difference between weather and climate?



Why do places near the ocean have milder temperatures than places far away from it?



What role do monsoon winds play in affecting India's climate?



Why is Chennai warm or hot throughout the year, while Leh is cold?



THANK YOU
