Climate of India - Class 10

- Lesson: Climate of India
- Class: 10
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- Subject: Social Studies
- Purpose: To understand India's weather, climate controls, seasons, and climate change.

Understanding Weather and Climate

- Weather: Short-term changes in temperature, rainfall, humidity, etc.
- Climate: Long-term average of weather patterns over 30+ years.
- Weather fluctuates daily or hourly, but climate remains stable over time.
- Climographs are used to show patterns of temperature and rainfall.
- India experiences diverse climates due to geography and other factors.

Factors Influencing India's Climate

- Latitude: Places closer to the equator (e.g., Chennai) are warmer.
- Land-Water Relationship: Coastal areas have moderate climate; inland areas show extremes.
- Altitude: Higher places like Shimla are cooler due to elevation.
- Upper Air Circulation: Jet streams and trade winds influence rainfall.
- Mountains and seas alter local climates significantly (e.g., Himalayas block cold winds).

Climate Zones of India

- Southern India lies in the tropical zone – hot and humid.
- Northern India lies in the temperate zone – with seasonal extremes.
- Western Ghats and Northeast get high rainfall due to orographic effect.
- Rain-shadow areas like Tamil Nadu receive less rainfall.
- Use of climographs helps understand monthly weather trends.

Seasons of India

- Winter (Dec–Feb): Cold in the north, mild in the south. Western disturbances bring rain.
- Summer (Mar–May): Very hot; dry winds called 'loo' blow.
- Advancing Monsoon (June–Sept): Southwest monsoon brings 75% of annual rainfall.
- Retreating Monsoon (Oct–Nov): Decreasing rain; tropical cyclones form.
- Indian calendar recognizes six traditional seasons (Vasantha, Grishma, etc.).

Monsoons – Lifeline of India

- Southwest Monsoon hits Kerala in June and spreads across India.
- Divided into Bay of Bengal and Arabian Sea branches.
- Responsible for agriculture, drinking water, and electricity production.
- Tamil Nadu gets rain from northeast monsoon during retreating phase.
- Monsoons are irregular and difficult to predict, causing floods or droughts.

Global Warming and Greenhouse Effect

- Greenhouse Effect: Earth's atmosphere traps heat, keeps it warm.
- Global warming is rapid due to human activity (fossil fuels, deforestation).
- CO_2 and methane are major greenhouse gases.
- Methane release from melting tundra is a dangerous feedback loop.
- AGW (Anthropogenic Global Warming) is the human-made rise in temperature.

Climate Change – Impact on India

- Sea levels may rise by 1 meter, displacing millions on the coast.
- Rainfall patterns are shifting – floods in some areas, droughts in others.
- Himalayan glaciers are melting – impacting rivers and farming.
- Super cyclones like Aila have devastated areas like Sundarbans.
- Urban poor and farmers are especially vulnerable.

Solutions and Responsibilities

- Developed countries want developing ones to reduce emissions.
- Developing countries argue they need fossil fuels for progress.
- Paris Agreement 2015: Signed by 195 nations to limit temperature rise.
- India's steps: Promoting solar energy, afforestation, clean mobility.
- Students can help by spreading awareness and saving energy.

Summary and Takeaways

- India's climate is shaped by geography, oceans, altitude, and winds.
- Four seasons affect agriculture, economy, and daily life.
- Climate change is real and urgent – caused by both natural and human factors.
- Global cooperation is necessary to reduce warming.
- Let us act locally and think globally to protect our planet.