Chapter 3: Climates of India

Questions — Questions and Activities

Q1 Match the climatic factors with their effects:

Column A — Column B

(1) Latitude — (a) Brings wet air to India during summer

(2) Altitude — (b) Creates different climates in the north and south

(3) Proximity to the ocean — (c) Keeps higher places cooler

(4) Monsoon winds — (d) Moderates the temperature

SOLUTION

Match each factor in Column A to the correct effect in Column B:

(1) Latitude → (b) Creates different climates in the north and south
India's north-south extent means places near the Equator are warmer while places farther north are cooler, producing different climatic zones.

(2) Altitude → (c) Keeps higher places cooler
As altitude increases, air pressure and density decrease, so the air is cooler. This is why hill stations and the Himalayas are cold even in summer.

(3) Proximity to the ocean → (d) Moderates the temperature
The sea heats and cools slowly, acting as a moderator. Coastal areas avoid extreme heat in summer and extreme cold in winter.

(4) Monsoon winds → (a) Brings wet air to India during summer
In summer, moisture-laden winds blow from the ocean towards the heated landmass, bringing heavy monsoon rainfall.

Answer: (1)→(b), (2)→(c), (3)→(d), (4)→(a)

Q2 Answer the following questions:

(a) What is the difference between weather and climate?

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

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

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

SOLUTION

(a) Weather vs Climate:

Weather is the day-to-day atmospheric condition — it can be sunny, rainy, hot, or windy on any given day. Weather keeps changing.
Climate is the long-term pattern of weather in a region over several decades. It is relatively stable.
In short: weather is what you get today; climate is what you expect in a region over many years.

(b) Why coastal places have milder temperatures:
The sea heats up and cools down slowly. In summer, sea breezes cool the coast and prevent extremely high temperatures. In winter, the sea retains heat and keeps coastal areas warmer than inland areas.
Example: Mumbai (coastal) has a smaller temperature range than Nagpur (inland), which swings from around 44°C in summer to 10°C in winter.

(c) Role of monsoon winds:
Summer (Southwest) Monsoon: The Asian landmass heats up, creating low pressure. Moisture-laden winds blow from the high-pressure Indian Ocean towards the land. This brings heavy rainfall to most of India from June to September.
Winter (Northeast) Monsoon: The land cools faster and creates high pressure. Winds reverse and blow from land to ocean — they are mostly dry. A part passing over the Bay of Bengal picks up moisture and brings rain to east and south India.
The monsoon determines when and where India receives its rainfall, shaping agriculture, water supply and the economy.

(d) Chennai warm; Leh cold:
Chennai is near the Equator (low latitude), so the sun's rays strike at a steep angle and concentrate solar energy — it stays warm or hot throughout the year.
Leh is at very high altitude in Ladakh. Air pressure and density decrease with altitude, making the air much cooler. Combined with a higher latitude, Leh remains cold with freezing winters.

Answer: (a) Weather = day-to-day condition (changing); climate = long-term pattern over decades (stable). (b) The sea heats/cools slowly, moderating coastal temperatures — summers not too hot, winters not too cold. (c) Southwest monsoon brings heavy rains (ocean winds blow inland in summer); northeast monsoon is mostly dry in winter, with some rainfall from Bay of Bengal. (d) Chennai: low latitude, intense sunlight, warm all year. Leh: very high altitude, thin cool air, cold throughout.

Q3 Look at a map of India given at the end of this book. Identify the climate for these cities — Leh, Chennai, Delhi, Panaji and Jaipur. Is the place near the sea, in the mountains, or in the desert? How do these factors affect the climate there?

SOLUTION

Leh (Ladakh): In the high Himalayan mountains. Very high altitude means very cold winters and cool summers — an alpine/cold desert climate. Being in the rain-shadow of the Himalayas, it receives very little rainfall.

Chennai (Tamil Nadu): On the eastern coast, near the Bay of Bengal. The sea moderates temperatures — warm or hot throughout the year (tropical climate). It receives rainfall from both the southwest and northeast monsoons.

Delhi: In the northern plains, far from the coast. No sea moderating effect, so it has a subtropical climate — very hot summers (above 40°C), cold winters, and a distinct monsoon rainy season.

Panaji (Goa): On the western coast, near the Arabian Sea. Sea proximity moderates temperatures. The Western Ghats cause very heavy southwest monsoon rainfall on the western slopes — a tropical wet climate.

Jaipur (Rajasthan): Near the Thar Desert, far from the coast. Flat terrain with no protection from dry, hot winds. Semi-arid climate — extreme heat in summer, cool nights, and sparse rainfall.

Answer: Leh: alpine/cold (high Himalayan altitude, rain-shadow); Chennai: tropical/warm-humid (eastern coast, near sea); Delhi: subtropical (northern plains, far from coast, extreme seasons); Panaji: tropical wet (western coast, heavy monsoon rain); Jaipur: semi-arid (near Thar Desert, far from coast, sparse rain).

Q4 Draw the monsoon cycle in summers and winters on a map of India. Label where the winds blow in summer and winter. Show the direction of winds during the monsoon.

SOLUTION

This is a map-drawing activity. Here is how to do it correctly:

Summer (Southwest Monsoon — June to September):
Draw arrows from the Arabian Sea and Bay of Bengal pointing TOWARDS India (northeast direction). Label these arrows 'Southwest Monsoon Winds'. Show rainfall (dots or shading) over most of India, with heavier shading on the Western

Ghats and the northeast.

Winter (Northeast Monsoon — October to December):
Draw arrows from the northern landmass (Central Asia/north India) pointing TOWARDS the sea in the southwest direction. Label these 'Northeast Monsoon Winds'. These winds are mostly dry. Show a small shaded area on the eastern coast (Tamil Nadu, Andhra Pradesh) and northeast to indicate rain from the Bay of Bengal.

Key labels to include on your map: Arabian Sea, Bay of Bengal, Western Ghats, direction of summer winds (NE), direction of winter winds (SW), rainfall zones.

Remember: in summer, winds blow from sea to land (bringing rain); in winter, winds reverse from land to sea (mostly dry, except eastern coast).

Answer: Summer: arrows from Arabian Sea and Bay of Bengal pointing inland (southwest monsoon, sea-to-land, brings heavy rain). Winter: arrows from north India pointing towards the sea (northeast monsoon, land-to-sea, mostly dry; eastern coast gets some Bay of Bengal rain). Label both sets of arrows, rainfall zones, and key geographic features.

Q5 Make a colourful poster showing festivals in India linked to farming and weather (e.g., Baisakhi, Onam). Add pictures or drawings of these festivals.

SOLUTION

This is a creative poster activity. Here is a guide for what to include:

Title: 'India's Farming Festivals — Celebrating the Seasons'

Include these festivals connected to farming and climate:
Baisakhi (April, Punjab and Haryana) — celebrates the rabi (winter crop) harvest, especially wheat. Draw golden wheat fields and people dancing.
Onam (August-September, Kerala) — celebrates the kharif harvest, rice, and the return of the mythical King Mahabali. Draw a pookalam (flower rangoli) and the snake boat race.
Pongal (January, Tamil Nadu) — thanks the sun god for a good harvest. Draw a clay pot boiling rice with sugarcane and turmeric.
Bihu (April and October, Assam) — marks the beginning of the agricultural year (spring Bihu) and the harvest (autumn Bihu). Draw traditional Bihu dance.
Lohri (January, Punjab) — marks the end of winter and celebrates the harvest of sugarcane. Draw a bonfire with people around it.

Add arrows or a small India map showing which region each festival belongs to, and which season or crop it celebrates.
Use bright colours to make the poster eye-catching.

Answer: Poster should include festivals such as Baisakhi (Punjab, wheat harvest, April), Onam (Kerala, rice harvest, Aug-Sep), Pongal (Tamil Nadu, harvest, January), Bihu (Assam, spring/autumn agricultural cycle), and Lohri (Punjab, winter/sugarcane harvest). Each should show the region, season, crop, and a small drawing or symbol.

Q6 Imagine you are a farmer in India. Write a short diary entry about how you would prepare for the rainy season.

SOLUTION

Model diary entry grounded in the chapter's discussion of monsoon and agriculture:

Date: Late May

The sky feels heavier each day. The elders say the southwest monsoon will reach us by early June, travelling up from the southern tip of India. I have no time to lose.

This week I must repair the bunds on the fields to prevent water from washing away the soil. I will check the irrigation channels to make sure they can carry the rainwater to my crops. I have already set aside seeds for the kharif season — rice for the wetter plots and some coarse millets for the lighter soil.

If the monsoon is good this year, the rivers will fill up and the groundwater will recharge. But I remember the year the monsoon was weak — grains became costly, water was scarce, and many of us faced real hardship. So I am also storing some grain from last year's harvest, just in case.

I hope the rains are timely and just enough — not so little that the crops wither, not so much that the fields flood. The whole year depends on these few monsoon months.

Answer: A farmer prepares by repairing field bunds, clearing irrigation channels, storing seeds for kharif crops, and keeping a grain reserve — knowing the entire year's agriculture, water supply and livelihood depend on the timely arrival of the southwest monsoon.

Q7 Identify a natural disaster (e.g., cyclone, flood, landslide, or forest fire) and write a short essay that includes the causes and impacts. Suggest actions that individuals, communities and the government can take to reduce the impact.

SOLUTION

Model essay — Floods in India

Causes:
Floods occur when water overflows into normally dry land. Heavy monsoon rainfall generates run-off that the land cannot absorb. Rivers and lakes overflow their banks. In the Himalayan regions, glacial bursts — caused by rapidly melting glaciers or excessive rainfall breaking through rock and ice barriers — cause sudden and devastating floods. In cities, floods are worsened by blocked drainage systems and concrete surfaces that prevent water from being absorbed.

Impacts:
Floods damage crops, roads, bridges and homes, and displace communities. They cause loss of human and animal life. The 2013 Uttarakhand glacial burst and landslides destroyed villages around Kedarnath and killed thousands. Floods also spread waterborne diseases and bring long-term economic hardship for farmers and labourers.

Actions to reduce impact:
Individuals: Avoid construction near riverbeds; keep drains clear; follow evacuation advisories promptly.
Communities: Plant trees to hold soil and slow run-off; preserve wetlands that absorb floodwater; build community early-warning systems.
Government: Improve city drainage; regulate construction in flood-prone zones; strengthen the National Disaster Response Force (NDRF); invest in weather forecasting and early-warning systems through the India Meteorological Department (IMD); promote afforestation.

Answer: Floods are caused by heavy monsoon rainfall, glacial bursts, and poor urban drainage; they damage agriculture, infrastructure and lives. Mitigation requires individuals to avoid flood-plain encroachment, communities to preserve natural drainage and plant trees, and the government to enforce zoning regulations, improve infrastructure, and strengthen the NDRF and IMD warning systems.