

Chapter 4: Land and Climate of Pakistan

Comprehensive Topographical Divisions, Drainage Systems, Climatic Zones, and Environmental Dynamics

Location and Strategic Land Configuration



Latitudinal & Longitudinal Extent

Situated between 23.5°N to 37°N latitudes and 61°E to 75°E longitudes, covering 881,913 sq. km.



Strategic Frontiers

Bounded by China to the north, India to the east, Afghanistan and Iran to the west, and Arabian Sea to the south.



Physical Diversity

Encompasses towering northern mountain ranges, fertile alluvial plains, arid plateaus, and coastal deserts.

The Northern and North-Western Mountain Ranges

The Karakoram

Karakoram & K2

Extends along Chinese border; features K2 (Godwin-Austen, 8,611m), the world's 2nd highest peak, and massive glaciers.

The Himalayas

Great & Lesser Himalayas

Parallels Karakoram; includes Nanga Parbat (8,126m) and scenic hill stations like Murree and Nathiagali.

Hindu Kush

Hindu Kush & Tirich Mir

Located in north-west along Afghan border; highest peak is Tirich Mir (7,690m); rich in historic passes.

Western Borderlands, Salt Range & Balochistan Plateau

Western Mountains

Includes Safed Koh, Waziristan hills, Sulaiman range, and Kirthar range acting as natural barriers.

Salt Range & Potwar

Located between Jhelum and Indus rivers; rich in mineral wealth (rock salt, coal, gypsum) and badland topography.

Balochistan Plateau

Arid plateau featuring inland drainage basins (Hamun-e-Mashkel), dry hills, and sparse pastoral vegetation.

The Indus Plain and Alluvial Formations

Upper Indus Plain

Extends from foothills of Himalayas down to Mithankot; characterized by interfluvial tracts known as 'Doabs'.

Lower Indus Plain

Spans from Mithankot to Arabian Sea in Sindh; broad flat floodplain shaped by meandering river shifts.

Alluvial Features

Includes active floodplains (Bela), old floodplains (Bar uplands), scalloped alluvial terraces, and deltaic swamps.

The Indus River System and Tributaries



The River Indus

Originates in Tibet (Mansarovar); flows 2,900 km through Pakistan into Arabian Sea.



Eastern Tributaries

Jhelum, Chenab, Ravi, Beas, and Sutlej (regulated by Indus Waters Treaty 1960).



Western Tributaries

Kabul, Swat, Kurram, Gomal, and Zhob rivers joining Indus from rugged western mountains.

Climatic Regions & Seasonal Variations

Highland Climate

Northern Highlands

Very cold winters with heavy snowfall; mild summers; precipitation exceeds 1000mm annually.

Arid & Desert Climate

Plains & Deserts

Hot summers (temperatures exceeding 45°C in Sibbi and Jacobabad); cold winters; very low rainfall.

Coastal Climate

Sindh–Makran Coast

Maritime influence moderates extreme temperatures; high humidity levels throughout the year.

Monsoon Rains & Western Depressions



Summer Monsoon (July–Sept)

Originated from Bay of Bengal and Arabian Sea; brings 70% of country's annual rainfall, vital for agriculture and river flows.



Western Depressions (Dec–Feb)

Originating from Mediterranean Sea; brings winter rains to upper Punjab and Khyber Pakhtunkhwa, and heavy snow to northern mountains.

Forest Types and Ecological Distribution

Coniferous Forests

Found in northern mountains (pine, fir, spruce); critical for timber and watershed protection.

Riverain & Irrigated Plantations

Bela forests along Indus banks and Changa Manga plantations supplying firewood and timber.

Mangrove & Thorn Forests

Coastal mangroves in Indus delta protecting shorelines; thorn shrubs in arid plains of Sindh and Punjab.

Environmental Challenges and Climate Vulnerability

Deforestation

Rapid loss of forest cover leading to soil erosion, landslides, and reduced wildlife habitats.

Glacial Melting & Floods

Global warming accelerates Himalayan glacier retreat, triggering catastrophic floods and water insecurity.

Desertification

Expansion of arid zones, waterlogging, and salinity degrading fertile agricultural lands.

Key Takeaways for Board Examinations

Relief & Drainage

Master mountain ranges elevations (K2, Nanga Parbat) and Indus river tributaries network.

Climate Factors

Understand monsoons, western depressions, and temperature extremes across climatic zones.

Conservation

Focus on afforestation, watershed management, and climate change adaptation strategies.



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End of Chapter 4 Notes. Revise thoroughly, practice map-work questions, and prepare for academic excellence!



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