

The Natural Topography

Students' Learning Outcomes

- Label the significant mountain ranges, plateaus, rivers, and plains of Pakistan on a physical map, and explain their importance to the country's physical and human geography.
- Analyze the natural topography of Pakistan, including the spatial distribution of physical features such as mountains, plateaus, rivers, and plains, using appropriate geographical vocabulary and terminology.
- Investigate the weather patterns, economy, natural vegetation, drainage systems, lifestyles, and cultures of people living in various landforms of Pakistan, using geographic representations and geospatial technologies to analyze the similarities and differences.
- Construct well-supported arguments with relevant evidence to assess the potential of Pakistan's natural topography for future growth and sustainability, considering opportunities for leisure, commercial, and economic development.

The mentioned SLOs are further classified into knowledge and skills for the better understanding of students.



Knowledge

- ❑ Name and identify these Landforms of Pakistan:
 - MOUNTAINS: Hindu Kush Karakoram and Himalayas
 - PLATEAUS: Potohar Plateau and Balochistan Plateau
 - PLAINS: The Upper Indus and Lower Indus Plain
 - DESERTS: Thar, Thal, Kharan
 - RIVERS: eastern and western tributaries of river Indus and rivers of Balochistan.
- ❑ Know the differences between the following:
 - Mountains of Northeastern and Western ranges of Pakistan.
 - Potohar and Balochistan plateaus.
 - Upper and lower plains of the Indus.
 - Thar, Thal and Kharan deserts.
 - Coastal regions of Pakistan in Sindh and Balochistan.
- ❑ Recognize the influence of the physical environment on human activities.



Skills

- ❑ Use a range of multiple sources such as Google maps, satellite images, photographs, diagrams, GPS, GIS, newspaper articles, thematic maps and field trips to derive information about natural topographic details of Pakistan including mountains, plateaus, plains, deserts and rivers.
- ❑ Annotate the important cities located in the different landforms of Pakistan and highlight the reason for their importance. (Mountain, plains, deserts and plateaus).
- ❑ Compare the important cities, weather, natural vegetation, drainage system, lifestyle and economy of the people for these landforms.
- ❑ Locate the eastern and western tributaries of the drainage system of Pakistan on map.
- ❑ Highlight the coastline of Pakistan and identify it on the map.
- ❑ Annotate the ports on map and relate the natural features of coastline with the development of ports. Analyze the role of Gwadar port in the development of Balochistan.
- ❑ Analyze the potentials for ports for future growth and suitability for development of infrastructure, commercial activities, leisure activities and economic development.
- ❑ Annotation on map by marking major cities (Islamabad, Lahore, Peshawar, Karachi, Quetta, Gilgit and Muzaffarabad) on the map of Pakistan.



Knowledge 3.1 The Topography of Pakistan

Topography, also known as relief or natural features, involves the inequalities or variations in the shapes and forms of the Earth's surface. Examples include mountains, valleys, plateaus, and plains, which are differentiated by their formation, configuration, and, notably, altitude (height). Pakistan boasts a rich array of physical features, which can be categorized into five main topographic divisions:

- Mountains
- Plateaus
- Plains
- Deserts
- Coastal Areas & Delta Region



— Developmental Activity

Provide students with maps of Pakistan that highlight its significant landforms. Instruct them to label these landforms on the maps.

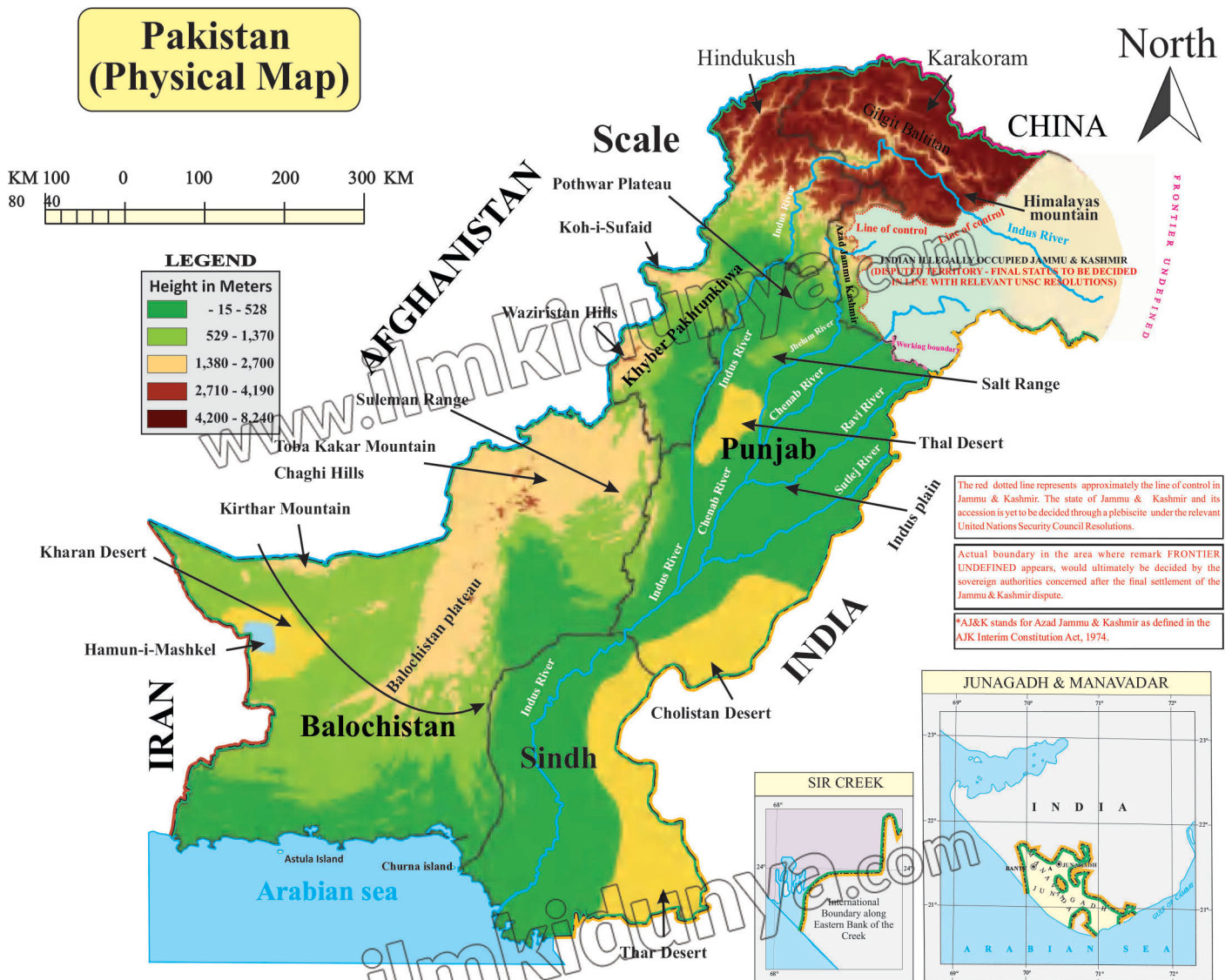


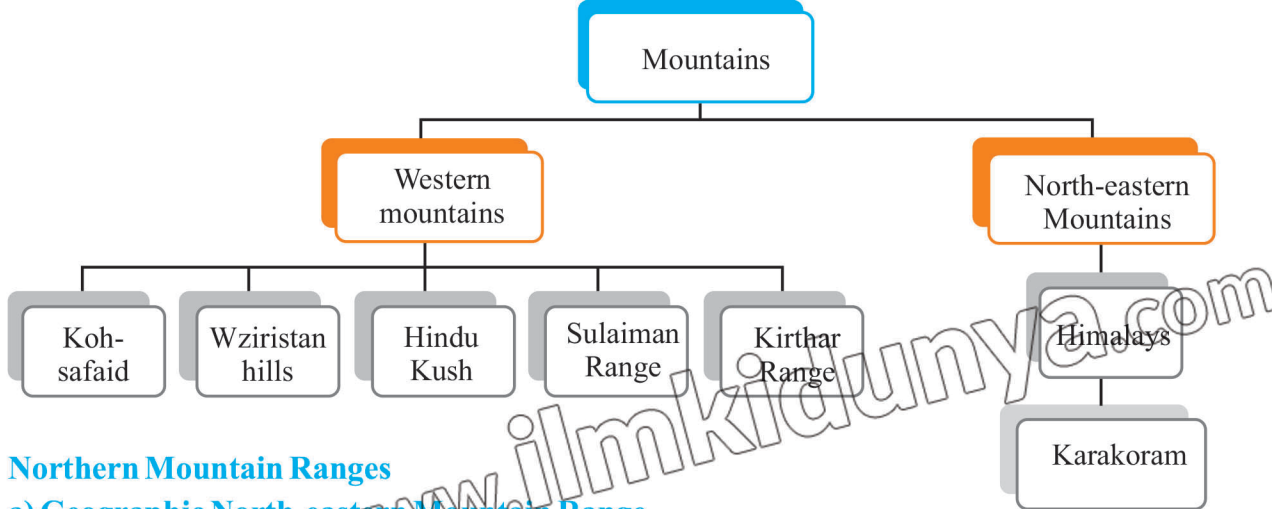
Fig 3.1 Physical features of Pakistan

*Source: <https://ncc.gov.pk>

3.1.1 Mountains

The mountain ranges of Pakistan are divided into;

- i. North-eastern Mountain Ranges
- ii. Western Mountain Ranges



Northern Mountain Ranges

a) Geographic North-eastern Mountain Range

The Himalayas, historically dividing South and Central Asia, form the northern boundary of the subcontinent. In Pakistan, the western ranges of the Himalayas stretch approximately 200 miles, encompassing;

The Shiwalik range (2000 to 3000) consists of low-altitude hills adjacent to Hazara, Attock, Rawalpindi, Jhelum, Gujarat and Sialkot districts.

The Peer Pinjal range (14000 to 15000 feet) runs parallel to Shivalik hills northward.

Central or Great Himalaya: Between Pir Pinjal and Karakoram ranges, average height: 2000 feet, snow-covered peaks throughout the year. Nanga Parbat, the highest peak (26600 feet), lies in this range.

Karakoram range: Lies north of central Himalaya in northern Kashmir and Gilgit. Average height: 20000 feet. Godwin Austin (K-2) is the highest peak in Pakistan (28,250 feet).

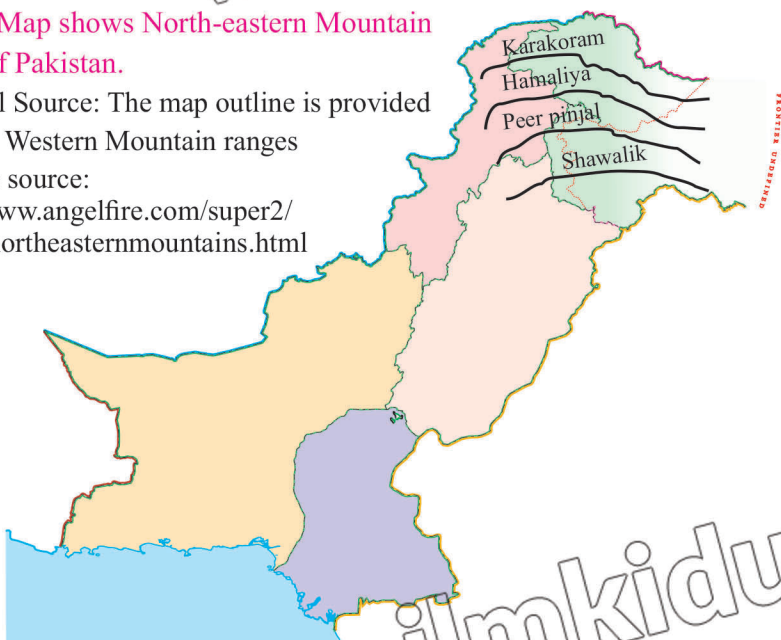
North Eastern Mountain Ranges

Fig. 3.2 Map shows North-eastern Mountain ranges of Pakistan.

*Original Source: The map outline is provided by NCC. Western Mountain ranges

From the source:

<https://www.angelfire.com/super2/geopak/northeasternmountains.html>



Teacher Note

Introduce various landform types in Pakistan and briefly discuss the significance of each. Present visuals corresponding to each landform type, and have students match the visuals to the respective landform types.

b) River Systems (Drainage)

Drainage is the natural or artificial process of water runoff from a particular area, encompassing the flow of water through streams, rivers, canals and other channels. In the context of the Northeastern mountains in Pakistan, drainage plays a crucial role in shaping the landscape and influencing the region's river systems. Notably, critical rivers like the Jhelum, originating from the Pir Panjal Range, the Indus, descending between the Zaskar and Ladakh Ranges and the Shyok, originating in the Karakoram Range, contribute to the intricate drainage patterns, influencing both the topography and natural beauty of the area.

c) International Borders and Connectivity

Beyond the Karakoram Range in the extreme north lies the Region of Kashgar, China. The completion of the Karakoram Highway in 1970 has enhanced connectivity, linking Gilgit in



Fig 3.3 Origin of key rivers of Pakistan from North-eastern Range.

*Source: <https://ncc.gov.pk>

Pakistan with Kashgar, promoting trade and communication. While the northeastern mountains pose challenges for easy traversal due to their considerable height strategic passes such as;

- The Babusar Pass
- The Darkot Pass
- The Shundur Pass
- The Khunjerab Pass

They facilitate communication across the region. These passes serve as crucial points for navigating through the imposing terrain, contributing to the overall connectivity of the area.

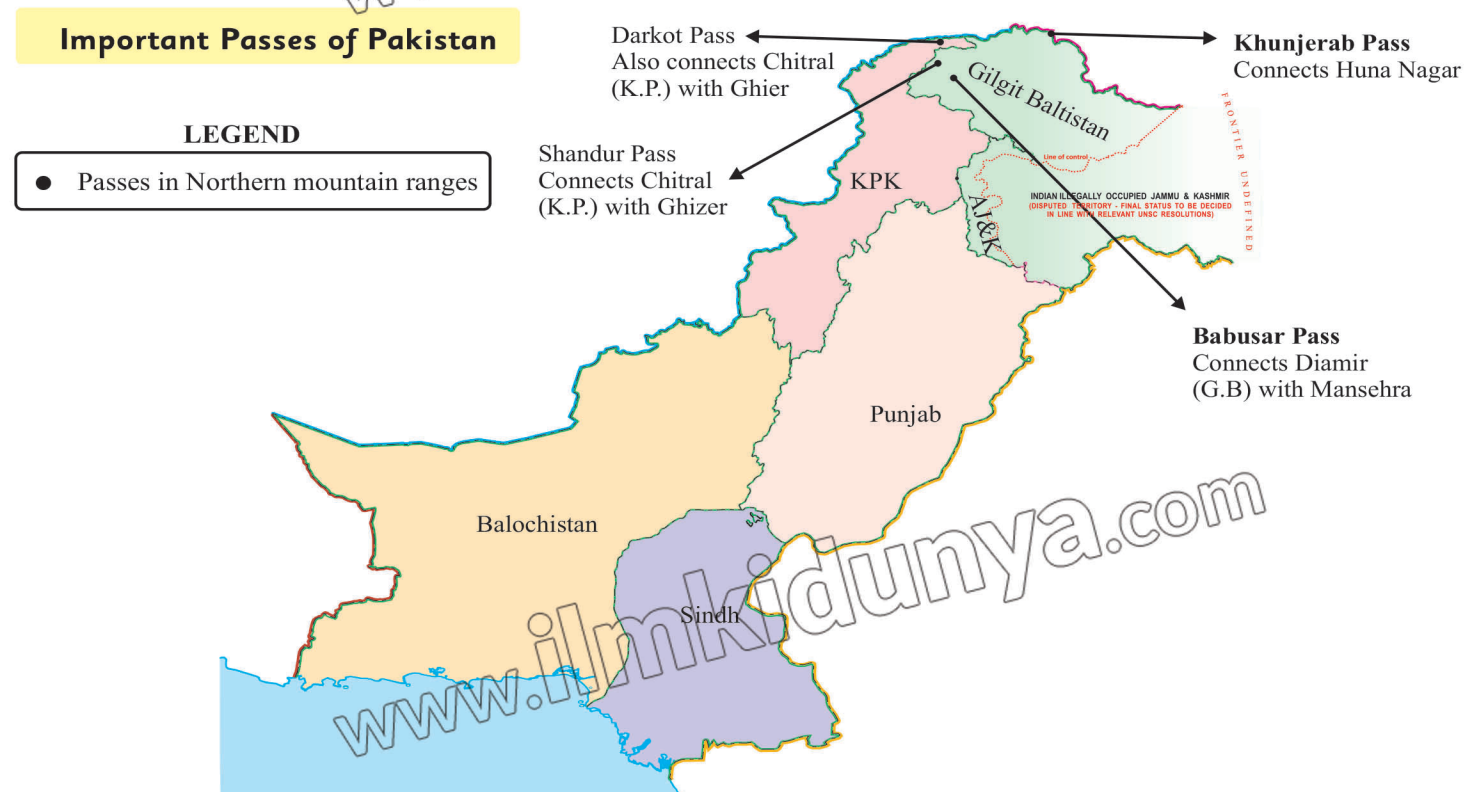


Fig 3.4 Different passes on map of Pakistan.

*Source: The map is provided by NCC modified to show Karakoram hiway and different passes.

d) Precipitation and Glacial Influence

The northern mountain barrier impacts Pakistan's precipitation patterns, intercepting monsoon winds and contributing to river flow. Glacial meltwater, including from the Siachen Glacier, feeds into rivers. Glaciers in the Karakoram Range have shown unusual growth due to global warming since the late 20th century.

e) Seismic Activity in the Region

Pakistan is located at the boundary of the Indian and Eurasian tectonic plates, making it a seismically active region. Major earthquakes have occurred in 1935, 1945, 1974, and 2005, with the 2005 quake causing significant casualties and destruction. Over 15,000 earthquakes were recorded between 2000 and 2022, with the

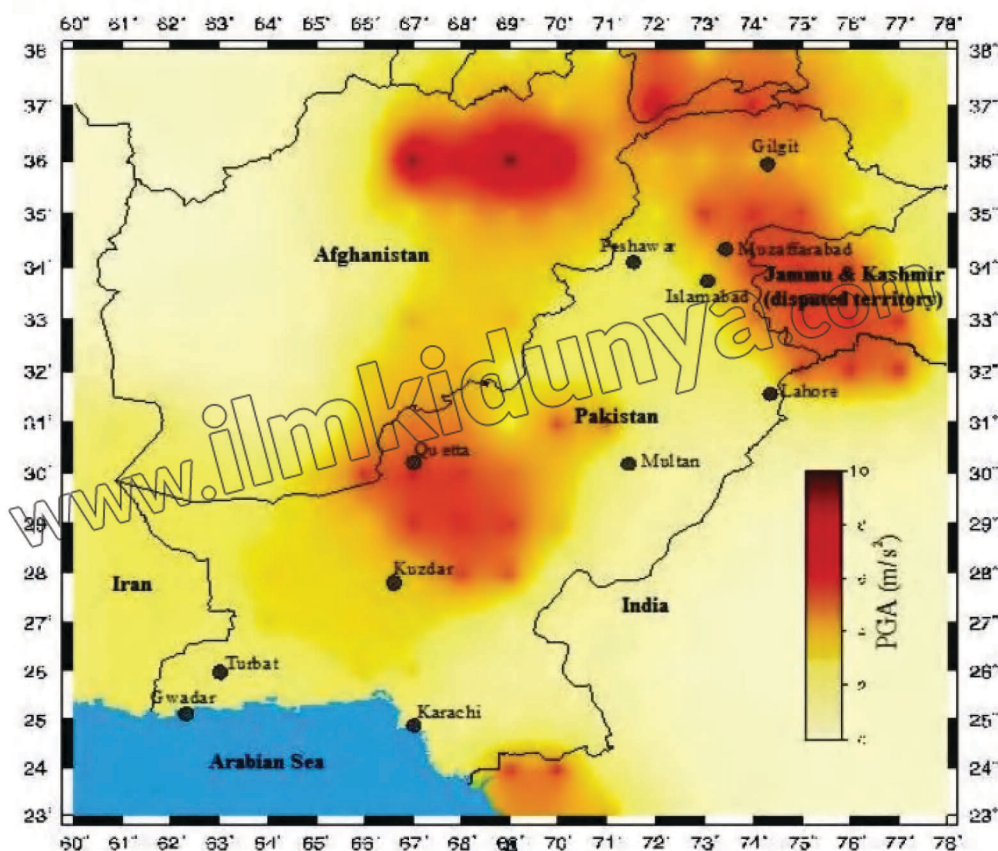


Fig 3.5 Seismic Hazard Map of Pakistan.



Fig 3.6 Fruit season in Hunza Valley:
Apple, peaches and cherry



— Do you know?

The Makran Subduction Zone is an area where one tectonic plate, the Arabian plate, is sliding beneath another, the Eurasian plate. In this case, the Arabian plate is moving northward and sliding beneath the Eurasian plate. This movement creates a zone where the two plates meet and interact.

Hindu Kush region experiencing the highest frequency. Active areas include the Hazara Kashmir Syntaxis, Northern Pakistan, and the southwestern Chaman Fault Zone, though major quakes occur infrequently. The Makran Subduction Zone, while having potential for large quakes, experiences slower plate movements.

f) Population and Agriculture in the Northern Region

The northern region, despite its inhospitable terrain, has a generally sparse population. Barley is the primary crop in many settlements, with fruit cultivation, especially of apricots, playing a crucial role. Timber, primarily pine, is found in some areas, but deforestation due to excessive logging and overgrazing has altered the landscape.

ii. Western Mountain Ranges

The north western ranges of our country are also known as western branches of the Himalayas mountains. These mountains consist of a series of parallel ranges and are lower in altitude than the northeastern mountains. As most of these ranges lie outside the course of summer monsoons coming from the Arabian Sea, the rainfall is low and they are almost bare of natural vegetation. These mountains act as a boundary between Afghanistan, Iran and our country. These mountain ranges lie north to south, having some passes in rivers and beds in the valleys. So, the northwestern mountains can be sub-divided into the following divisions:

a) Hindu Kush:

- Between Indus and Kabul rivers.
- Average height: 10,000 to 16,000 feet.
- Highest peak: Tirch Mir (7700 meters).
- Snow-covered in winter.
- Rivers: Kabul, Swat, Panjkora, Kunar.
- Notable pass: Khyber Pass (historic trade route).

b) Koh-Safed:

- South of Kabul River up to Kurram Pass.
- East-west orientation.
- Average height: 3600 meters.
- Often covered with snow in winter.
- River: Kurram;
- Significant pass: Kurram Pass.
- Important military base: Kohat.

c) Waziristan Hills:

- Between Kurram and Gomal rivers.
- Low altitude hills.
- Tochi River joins Kurram River from the west in North Waziristan.
- Rivers pass through Tochi pass to join the Indus.
- Gomal River from Afghanistan joins Indus near Dera Ismail Khan.
- Key towns: Bannu (Tochi pass), Dera Ismail Khan (Gomal pass).

d) Sulaiman Mountain:

- South of Gomal river.
- Length: about 300 miles.
- Highest peak: Takhat-I-Sulaimani (11,100 feet).
- Bugti and Mari hills at the southern end.
- Bolan River passes through Bolan Pass (communication between Iran and Pakistan).
- Key base: Queta at the northern end of Bolan pass.

e) Kirther Mountains:

- In the west of lower Indus plain.
- Average height: about 7000 feet.
- Drained by Hab and Layari streams.
- Streams join the Arabian Sea near Karachi.

Western mountain ranges with rivers



Fig 3.7 Western Mountain ranges with rivers.

*Source: NCC, (Important Rivers of Pakistan with addition of Western mountain ranges)

3.1.2 Plateau

Plateaus are the areas of little variation, lesser than mountains and higher than plains. In Pakistan there are two plateaus.

- Potohar plateau
- Balochistan plateau

i. Potohar Plateau

Geographical Location and Topography

It is situated in Sindh Sagar Doab, the Potohar Plateau lies between the Indus and Jhelum rivers. Encompassing regions such as Jhelum, Rawalpindi, Islamabad, and Attock, it features the renowned Salt

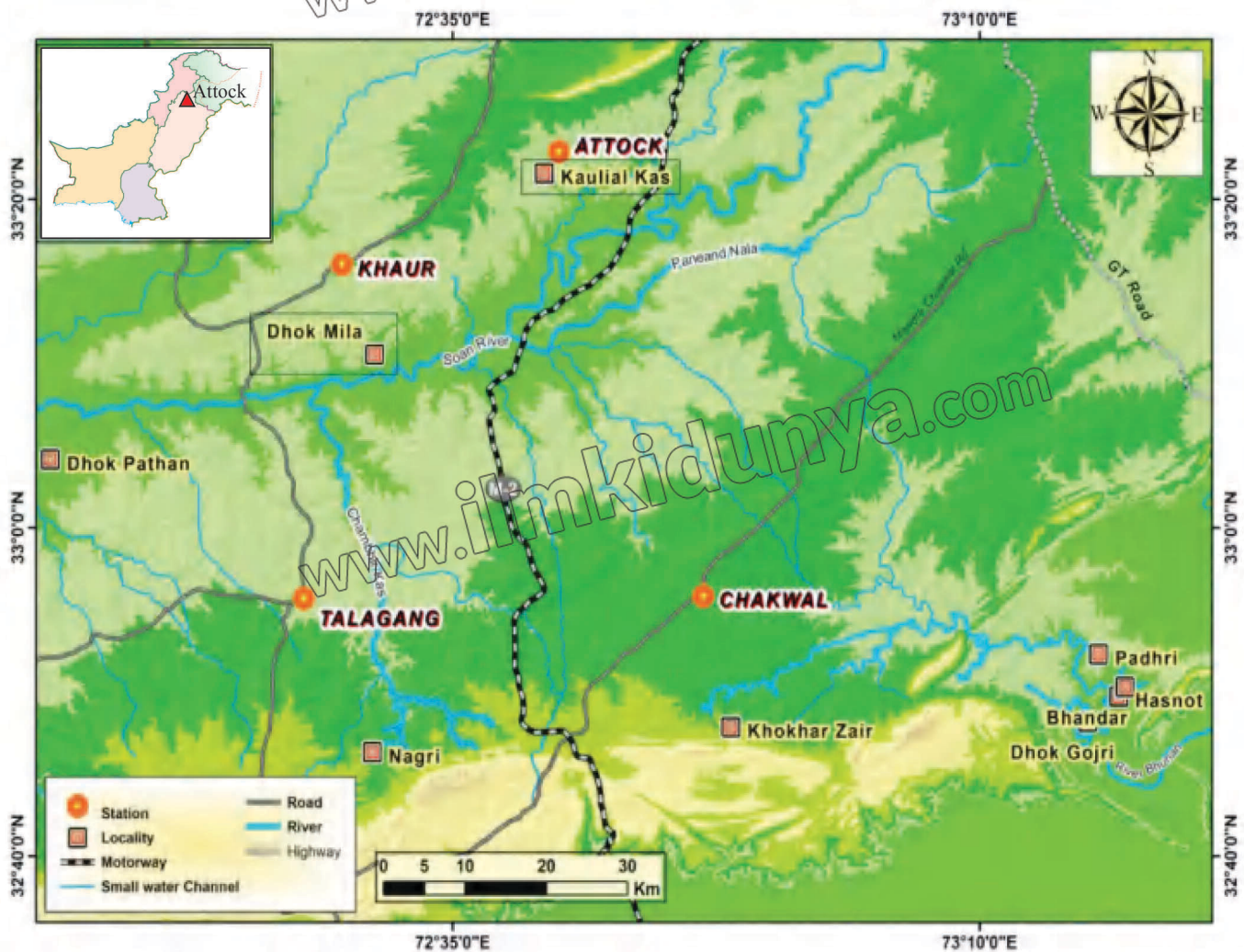


Fig 3.8 Map of Potohar Plateau.

*Source: <https://www.researchgate.net/>

Ranges. The topography, characterized as badland topography, showcases erosion effects from wind and water action. This results in irregular depressions, ridges, residual hills, ravines and faulted land.

a. Altitude

With a low mountain altitude ranging from 500 to 900m in the north-south direction (e.g., Kalachitta, Margala hills) and the Salt Ranges reaching 750 to 1000m in the east-west direction, the plateau boasts diverse elevations. The highest peak, Sakesar Peak, stands at an impressive 1527m. While gorges exist, they are not exceptionally deep.

b. Drainage and Water Features

Given its doab location, the Potwar Plateau has limited drainage. Prominent rivers such as Soan, Khewra and Makrahi streams traverse the area. Notable water bodies include Lake Kallar Kahar, Khabeki and Uchchali. Agriculture relies on rainfall, emphasizing barani farming, while the plateau's economic strength is reinforced by industries like oil refineries, HMC Taxila and mining activities yielding minerals such as rock salt, marble, clay, oil and coal.

ii. Balochistan Plateau

a) Geographical Location and Altitude

Situated in the southwest, the Balochistan Plateau spans altitudes from 600 to 3010 meters. The southern hills and ranges are lower than their northern counterparts. Northern Balochistan showcases irregular depressions like the Zhob and Loralai basins, while high, cold mountains surround valleys such as Quetta, Ziarat, and Pishin.

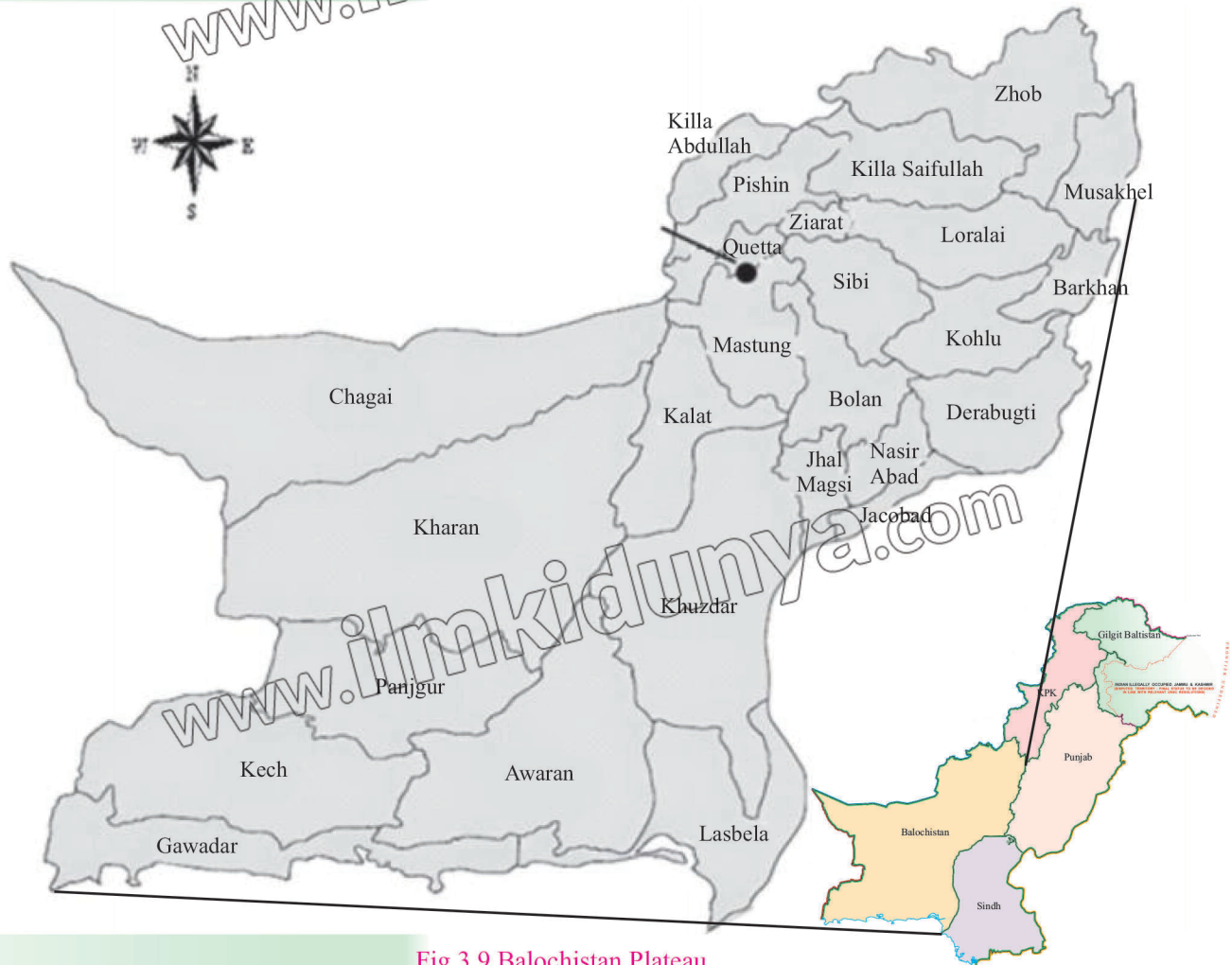


Fig 3.9 Balochistan Plateau.

*Source: <https://www.researchgate.net/figure/Map-of-Balochistan>

b) Mountain Ranges and Passes

Covered by barren mountains ranging from 600 to 3010m, the plateau features Chagai hills, Ras Koh, Hala Ranges, Makran Coast Ranges, Central Brahui Ranges, Toba Kakar Range, and Siahan Range. Noteworthy passes include Bolan, Ghonsher, and Kojak. The extensive topography includes the plains of Kachi Sibi and Lasbela, leading to the coastal area of Makhran.

c) River Systems and Inland Drainage

Balochistan hosts several small rivers, including Zhob, Khandhar, Kalachi, Bolan, Mula, and Chakar, and those falling into the Arabian

Sea, such as Hub, Porali, Hingol, and Mushkai. Inland drainage basins form temporary lakes known as Hamuns, with Hamun-i-Mashkel being the largest near the Kharan Desert. These rivers, predominantly seasonal, experience increased flow during summer (snowmelt) and winter (western depressions).

d) Karez Systems

An essential feature of the Balochistan plateau is the Karez, which are underground canals for irrigation extending several kilometres. Originating at the foot of mountains, they play a crucial role in water distribution, particularly in areas like Quetta and Ziarat valleys.

3.1.3 Plains; Indus River Plains

The Indus River plain sprawls across approximately 200,000 square miles (518,000 square km) of fertile land, gently sloping from the Himalayan piedmont in the north to the Arabian Sea in the south. With an average gradient of no more than 1 foot per mile (1 meter per 5 km), this expansive plain is characterized by its featureless landscape. The plain is divided into two sections, distinguished by their physiographic features.

i. Upper Indus Plain: (All of Punjab Province)

The upper Indus Plain is marked by three subdivisions: The Himalayan Piedmont, the Doabs, and the Sulaiman Piedmont (referred to locally as the Derajat). Each subdivision presents unique characteristics that contribute to the overall diversity of the plain.

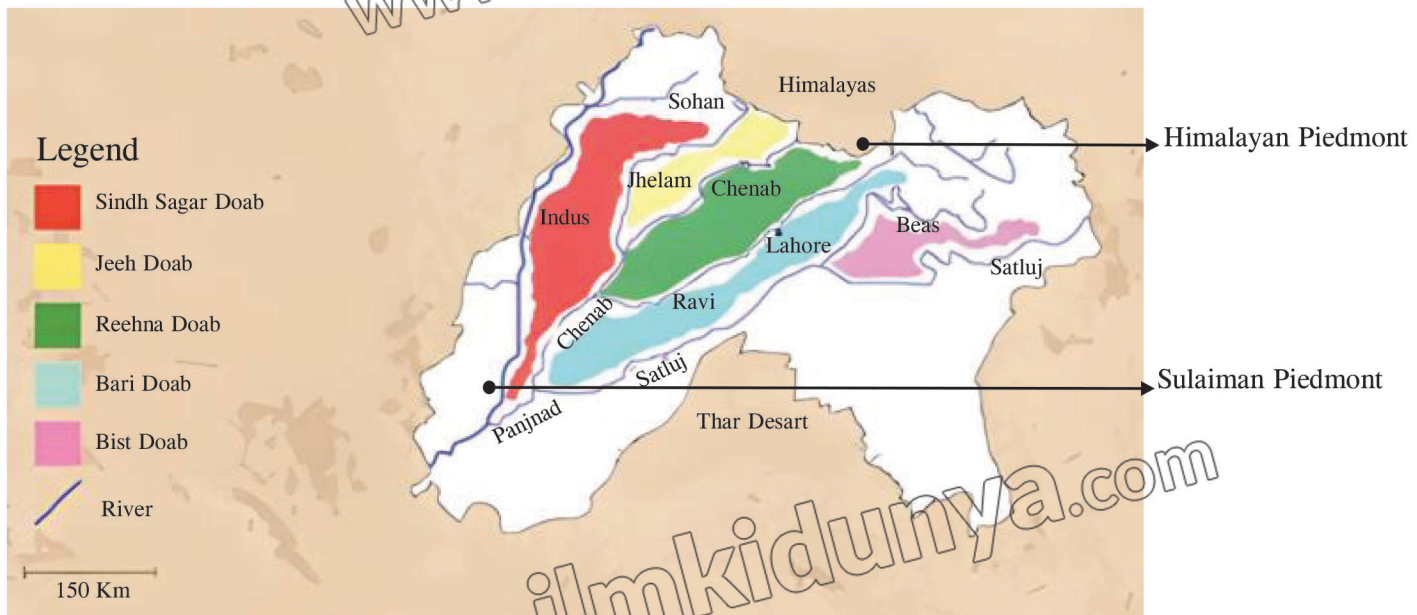


Fig 3.10 Map of Upper Indus Plain (Punjab) and Doabs. Source: <https://www.researchgate.net/>. Modified by author.

a) Himalayan Piedmont: Entrance to the Plain

The Himalayan Piedmont, or sub-Shawalik zone, is a narrow strip of land where rivers enter the plain from their mountain stages, creating a steeper gradient. Characterized by numerous rivulets, this zone

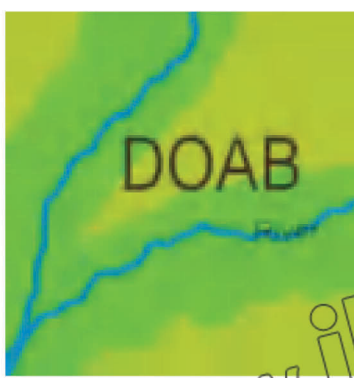
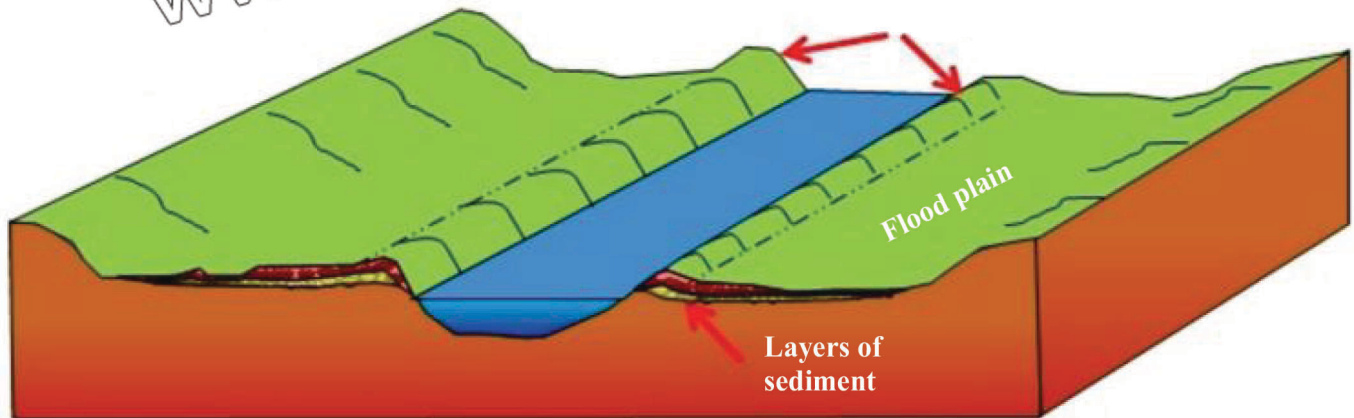


Fig 3.14 Doab: Land between two rivers

exhibits a broken topography during the rainy season when these streams swell into powerful, erosive watercourses.

b) Doabs: Micro Relief and Landforms

The doabs, the spaces between various rivers, showcase four distinct landforms—active floodplains, meander floodplains, cover floodplains and scalloped interfluvies. These features contribute to the unique micro-relief of the doabs, creating a mosaic of landscapes.



- **Active Floodplain:** Located adjacent to rivers, this floodplain is submerged almost every rainy season. Protective bunds (levees) attempt to contain river water during this period.
- **Meander Floodplain:** Occupying higher ground away from the river, this area features bars, oxbow lakes, extinct channels and levees.
- **Cover Floodplain:** Comprising geologically recent alluvium, this expanse results from sheet flooding, covering former riverine features.
- **Scalloped Interfluvies (Bars):** The central, higher parts of the doab with uniform-textured old alluvium. River-cut scarps delineate their boundaries.



Fig 3.15 Meander and Ox-bow Lakes

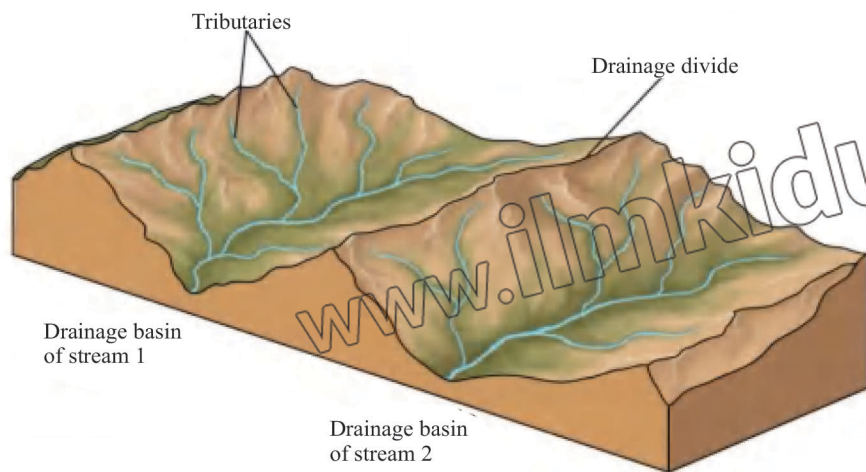


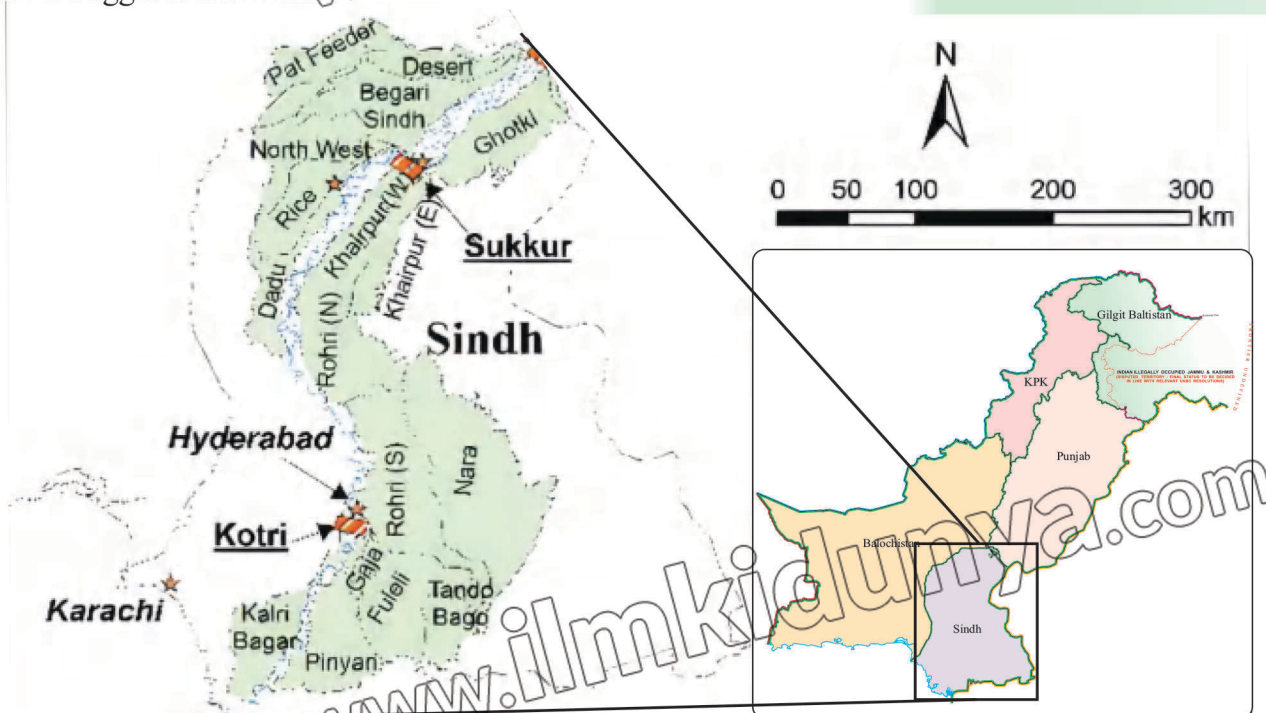
Fig 3.16 Scalloped Interfluvies

■ **Sindh Sagar Doab:** The Sindh Sagar Doab, the largest but economically poorest, lies between the Indus and Jhelum rivers. Predominantly desert, it contrasts with the agriculturally rich doabs lying to the east.

a) Sulaiman Piedmont (Derajat): Differing from the Himalayan piedmont, this region is generally dry with an undulating surface, numerous streams, and steep gradients.

i. Lower Indus Plain: All of Sindh Province

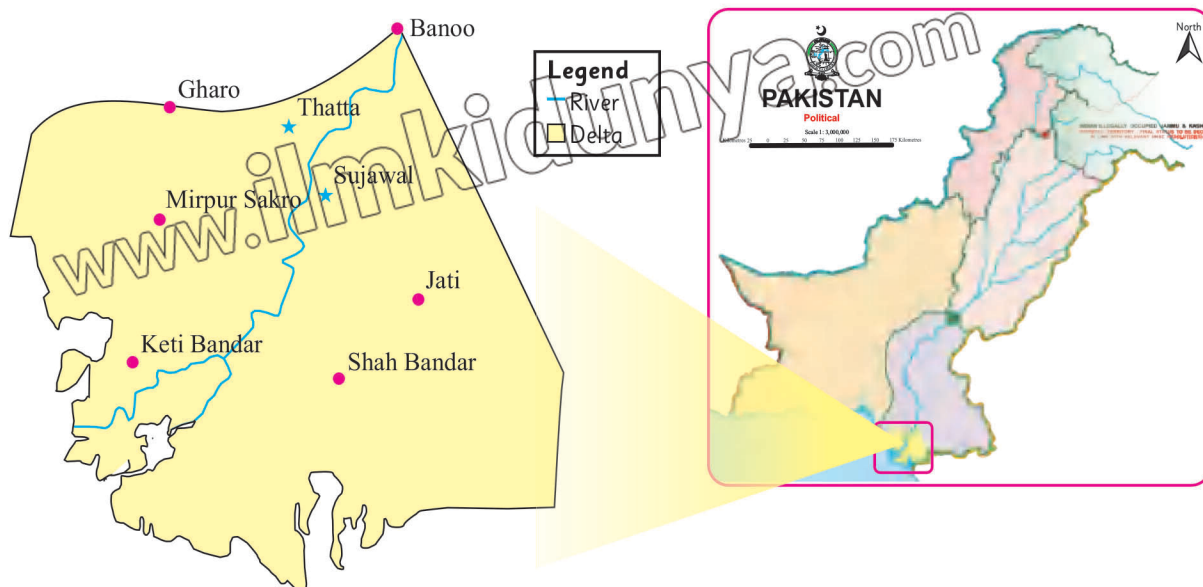
The lower Indus plain, coursing through Sindh province, features a flat terrain with a slight gradient of 1 foot per 3 miles (1 meter per 10 km). The micro-relief mirrors that of the upper Indus plain, with the Indus and its banks rising higher than the surrounding land due to the river's aggradation work.



Map showing Areas of Lower Indus Plain. Source: <https://www.researchgate.net/figure/Indus-Basin->

a) Indus Delta

The Indus Delta, with its apex near Thatta, gives rise to distributaries forming the deltaic plain. Southeast of this point lies the saline marshland known as the Rann of Kachchh (Kutch). The coastal tract, low and flat, experiences elevations only where the Pabbi Hills meet the coast between Karachi and Ras Muari.



Map of Indus Delta. Source: <https://www.researchgate.net/>

a) Unique Features and Challenges in the South

Manchhar Lake and Groundwater Quality

Manchhar, a marshy lake west of the Indus, fluctuates from 14 square miles (36 square km) at low water to an expansive 200 square miles (500 square km) when full, making it one of the largest freshwater lakes in South Asia. Groundwater quality varies, with saline water predominating in the southern zone (Sindh), rendering it unsuitable for agriculture.

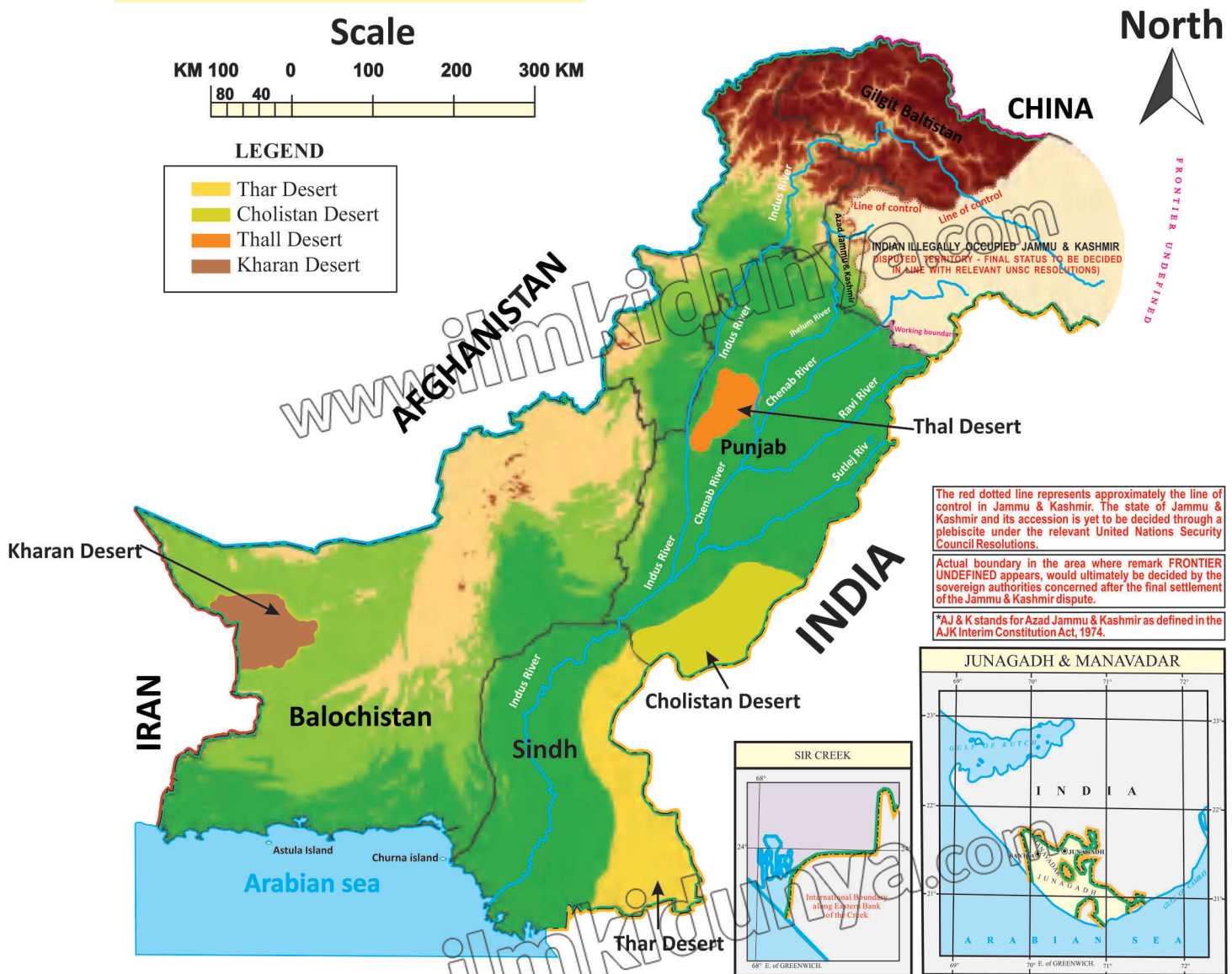
Waterlogging and Salinity Challenges

Extensive areas in both the northern and southern zones of the plain grapple with waterlogging and salinity issues. The Indus Delta, in contrast to the Ganges-Brahmaputra Delta, presents a wild and less developed landscape. The convergence of high tides and Indus floods results in extensive flooding along the littoral zone.

3.1.4 Deserts

The uniqueness of Pakistan's topography is also backed by the fact that around 10% of its total land has been covered with different types of barren lands, commonly known as deserts. Found in different regions across the country, the deserts of Pakistan are best known for their unique features, which also differentiate them from each other. Let's begin by listing down the names of some of the most famous deserts of Pakistan:

Deserts of Pakistan



Map of Pakistan showing Desert Areas.

*Source: NCC, modified by author by just showing the deserts.

i. Thar Desert:

Straddling the India-Pakistan border, the Thar Desert, also known as the Great Indian Desert, stands as one of the world's largest deserts. Covering a quarter of a million square kilometres, with 85% in India and 15% in Pakistan, it is a vast expanse of rolling sandhills. Remarkably, despite its harsh conditions, the Thar Desert is home to around 30 million people, earning it the moniker "Friendly Desert." The residents, mainly practising Islam and Hinduism, contribute to the cultural diversity, celebrating vibrant festivals throughout the year. Predominantly rural, the population engages in agriculture and animal husbandry, with a significant nomadic presence. The Thar Desert also hosts diverse wildlife, including rare animals and migratory birds, adapted to the challenging desert environment. Notable species include Blackbuck, Chinkara, peacock, eagles and vultures.

ii. Cholistan Desert

It is also known as Rohi. It has a vast expanse in Pakistan, covering 16,000 square kilometres near Bahawalpur. Inhabited by semi-nomadic communities, it's known for its cottage industry, producing cotton and wool products, blankets, rugs, and jewellery. Nomads rely on livestock for their livelihood. The desert hosts diverse wildlife, including the rare Desert wolf and migratory birds like the Houbara bustard. The historic Derawar Fort stands as a testament to the region's rich history. Cholistan also features the Dodhla Forest, a well-protected rainforest with lush greenery and rare plant species, adding a unique touch to its arid landscape.

iii. Thal Desert

In western Punjab's Jhang district lies the Thal Desert, spanning 305 kilometres. Contrary to expectations, it features captivating sand dunes against a clear blue sky, with occasional wind cyclones. During February and March, the desert turns lush green due to the cultivation of green chickpeas, reverting to emptiness after harvest. Notably, the Greater Thal Canal aids agricultural water distribution. Despite its vastness, inhabitants live in colonies, requiring extensive travel for work or visits to Punjab.

i. Kharan Desert

It is counted among the most famous and largest deserts of Pakistan and sprawls across the barren expanses of Balochistan. Noteworthy for its extremely arid climate, it covers 20,000 square kilometres with a sparse population of just 0.23 million, ranking among the least populated deserts globally. To the north, east, and west of the desert, mountainous plateaus rise to around 3000 meters, extending into Iranian territory. The vast isolated plain within the desert served as Pakistan's second nuclear testing facility in 1988.



Map showing Coastal Areas of Pakistan.
Source: researchgate.net/figure

3.1.5 Coastal Area

Pakistan has a diverse coastline along the Arabian Sea, stretching approximately 1,046 kilometres (650 miles). Pakistan's coastal areas include the provinces of Sindh and Balochistan. Here are some notable coastal areas:

i. Makran Coast

The Makran coast is located in the southwestern province of Balochistan. It stretches for over 720 kilometres (450 miles) from the Iranian border to Karachi, Pakistan's largest city. The Makran coast is known for its rugged and mountainous terrain, with a narrow coastal plain. It is also home to some of Pakistan's most beautiful beaches,

such as Ormara Beach and Gwadar Beach. The Makran coast is an important biodiversity hotspot with a variety of marine and terrestrial plants and animals.

ii. Sindh Coast

The Sindh coast is located in the southeastern province of Sindh. It stretches for over 270 kilometres (170 miles) from Karachi to the Indian border. The Sindh coast is known for its flat and sandy terrain, with a wide coastal plain. It is home to the Indus Delta, which is the world's largest mangrove forest. The Sindh coast is also an important agricultural region, with a variety of crops being grown, including rice, wheat, and cotton.

iii. Coastal Cities

Pakistan's coastline is home to a number of important cities, including:

- Karachi, Sindh Province: Pakistan's largest city and a major port city.
- Gwadar, Balochistan Province: A deep-water port city that is being developed as a major economic hub.
- Ormara, Balochistan Province: A popular beach resort town.
- Keti Bandar, Sindh Province: A fishing village with a beautiful beach.

Research and analysis

Conduct research on significant landforms in Pakistan, including mountains, plateaus, plains, deserts, and rivers, and examine their significance in Pakistan's geography. Perform a comparative analysis between the Northeastern and Western Mountain ranges, Potohar and Balochistan plateaus, Upper and Lower Indus Plains, Thar, Thal, and Kharan deserts, as well as coastal regions in Sindh and Balochistan. Explore the impact of a chosen landform on human activities, detailing how it affects livelihoods and cultural practices. Summarize research findings and engage in a discussion on how these landforms influence human activities in Pakistan.



Map showing Major Ports of Pakistan. Source: Google Images, modified by author

**Skill: 3.1-3.5**

Use a range of multiple sources such as Google maps, satellite images, photographs, diagrams, GPS, GIS, newspaper articles, thematic maps and field trips to derive information about natural topographic details of Pakistan including mountains, plateaus, plains, deserts and rivers.

Annotate the important cities located in the different landforms of Pakistan and highlight the reason for their importance. (Mountain, plains, deserts and plateaus).

Locate the eastern and western tributaries of the drainage system of Pakistan on map.

Highlight the coastline of Pakistan and identify it on the map.



Annotate the ports on map and relate the natural features of coastline with the development of ports. Skill sheet will be provided via QR code.

- Astola Island, Sindh Province: A small island off the coast of
- Karachi that is known for its beaches and its turtle nesting grounds.



iv. Important Ports

- **Karachi Port:** It is the largest and busiest port in Pakistan. It is located in Karachi, Sindh.
- **Port Muhammad Bin Qasim:** It is the second largest port in Pakistan. It is located in Karachi, Sindh.
- **Gwadar Sea Port:** It is a deep-sea port located in Gwadar, Balochistan.
- **Port of Pasni:** It is a small port located in Pasni, Balochistan.

Knowledge 3.2 Differences between Physical Features**3.2.1 Difference between Northeastern and Western ranges of Pakistan**

Feature	Northeastern Mountains	Western Mountains
Location	Northern and northwestern Pakistan	Western and southwestern Pakistan
Formation	Younger fold mountains	Older fold mountains
Highest peaks	K2 (8,611 meters), Nanga Parbat (8,126 meters)	Tirich Mir (7,690 meters)
Climate	Cold, arid	Dry, subtropical
Precipitation	High snowfall, up to 1500mm annual rainfall	Low rainfall, 200-500mm annual rainfall
Vegetation	Forests of pine, oak, etc. at lower altitudes; grasslands and alpine meadows at higher altitudes	Sparse scrubland and grasslands
Lifestyle	Agriculture, livestock farming, pastoral nomadism	Economic activities like mining, forestry, outdoor recreation
Tourism	Popular for mountaineering, trekking and camping	Less popular, but more accessible
Example	 <p><i>Alpine meadows in Northeastern Mountains</i></p>	 <p><i>Scrubland in Western Mountains</i></p>

3.2.2 Difference between Potohar and Balochistan plateaus

Feature	Potohar Plateau	Balochistan Plateau
Location	Northeastern Pakistan	Southwestern Pakistan
Geology	Dissected plateau	Rugged plateau
Climate	Subtropical	Desert
Average annual precipitation	500 millimeters (20 inches)	Less than 250 millimeters (10 inches)
Vegetation	Scrubland, grassland, some forests of pine and other trees	Desert vegetation, such as shrubs and grasses, some forests of juniper and other drought-tolerant trees
Lifestyle	Mostly settled, with a focus on agriculture	Mostly nomadic or semi-nomadic, with a focus on herding
Example	 <p>Grasslands of Potohar region</p>	 <p>Dry- arid region in Balochistan Plateau</p>

3.2.3 Difference between Upper and Lower Indus Plains

Feature	Upper Indus Plain	Lower Indus Plain
Location	Northern and northwestern Pakistan	Southern Pakistan, mainly Sindh province
Landscape	Network of doabs (interfluves)	0-150 meters (0-492 feet)
Climate	Subtropical, moderate rainfall	Arid, very low rainfall
Agriculture	Variety of crops, intensive	Crops adapted to arid conditions, limited
Precipitation	Moderate rainfall, average annual precipitation of about 500 millimeters (20 inches)	Very low rainfall, average annual precipitation of less than 250 millimeters (10 inches)
Lifestyle	Settled lifestyle, agriculture as the main occupation	Nomadic or semi-nomadic lifestyle, herding as the main occupation
Cultural Heritage	Rich, diverse	Diverse, Sindhi, Baloch influences

3.2.4 Difference between Thar, Thal and Kharan Desert

Feature	Thar Desert	Thal Desert	Kharan Desert
Location	Southeastern Pakistan	Central Pakistan	Southwestern Pakistan
Formation	Subtropical desert	Subtropical desert	Cold desert
Climate	Hot, arid	Hot, arid	Cold, arid
Precipitation	Sparse and irregular, 200 millimeters (8 inches) annually	250 millimeters (10 inches) annually	250 millimeters (10 inches) annually
Vegetation	Thorny shrubs, scattered trees	Thorny shrubs, scattered trees	Shrubs and grasses adapted to cold and arid conditions
Wildlife	Desert fox, Indian wolf, blackbuck, great Indian bustard	Desert fox, Indian wolf, blackbuck, houbara bustard	Asiatic wild ass, Persian leopard, sand grouse

3.2.5 Difference between Coastal regions of Pakistan in Sindh and Balochistan.

Feature	Sindh Coast	Balochistan Coast
Geographical Features	Flat, sandy terrain with mangrove forests and mudflats, Indus Delta	Rugged and diverse land rocky shores, sandy beaches cliffs, deep sea port of Gwadar
Climate	Tropical monsoon climate, hot and humid summers, mild winters, average annual rainfall 200-300 mm	Subtropical arid climate, hot summers, cool winters, average annual rainfall less than 250 mm
Ecology	Rich marine biodiversity, mangrove forests, Ramsar wetland site	Marine biodiversity, fish species, coral reefs, marine turtles, unique ecosystems
Cultural Heritage	Influenced by Indus Valley Civilization, Persian empires, Arab traders, fishing, boat building, traditional crafts, vibrant festivals	Reflects traditions of Baloch people, nomadic lifestyle, fishing, herding, traditional handicrafts, historical ruins



Project 1

Divide students into groups based on the type of landform. Deliberate on the importance of these landforms in the context of Pakistan's geography, economy or culture. Each group is to present the significance of their assigned landform and encourage active discussions and questions.



Skill: 3.6-3.8

- Analyze the role of Gwadar port in the development of Balochistan.
- Compare the important cities, weather, natural vegetation, drainage system, lifestyle and economy of the people for these landforms.
- Analyze the potentials for ports for future growth and suitability for development of infrastructure, commercial activities, leisure activities and economic development. Skill sheet will be provided via QR code.

Knowledge 3.3 Influence of the Physical Environment on Human activities

Pakistan's physical environment, encompassing its diverse landscapes, climatic conditions, and natural resources, has played a profound role in shaping human activities and cultural traditions throughout the country's history.

i. Agriculture and Water Resources

The Indus River, Pakistan's lifeline, has been instrumental in supporting agriculture since ancient times. Its fertile alluvial plains have allowed for the cultivation of a variety of crops, including wheat, rice, maize, and cotton. The river's floodwaters, while sometimes destructive, also provide essential nutrients for the land, contributing to the region's agricultural productivity.

ii. Pastoralism and Nomadic Lifestyle

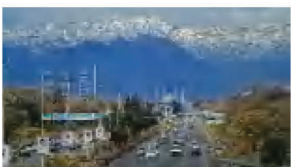
The arid and mountainous regions of Pakistan, particularly Balochistan, have historically supported a nomadic lifestyle. The sparse vegetation and limited water resources in these areas have necessitated a reliance on herding. Livestock, such as sheep, goats, and camels, is a primary source of food and income. Nomadic communities have adapted to the harsh environment, moving their herds to find grazing pastures and water sources.

iii. Trade and Transportation

Pakistan's strategic location along the Silk Road and its access to the Arabian Sea have played a significant role in shaping trade and transportation routes. The Indus River has served as a vital waterway for trade and transportation, connecting inland regions to the coast and facilitating the exchange of goods and ideas. The country's mountainous terrain has also presented challenges and opportunities for transportation, with the construction of roads and bridges enabling access to remote areas.

iv. Urban Development and Settlement Patterns

The physical environment has influenced the location and development of cities in Pakistan. The Indus River's floodplain has attracted settlements due to its fertile land and access to water, leading to the growth of cities like Karachi, Hyderabad, and Sukkur. In other regions, cities have emerged in strategic locations along trade routes or in areas rich in natural resources.



Islamabad



Karachi



Lahore



Indus River



Irrigated rice fields on the bank of the Indus River



Sheep Grazing in Balochistan



Karakoram Highway



Teacher Note

Provide students with a worksheet containing guiding questions related to the influence of physical environments on human activities. Ask them to answer these questions based on their understanding and the group discussions.



— Developmental Activity

Divide the class into small groups and provide each group with a specific physical environment to focus on. Ask them to discuss and brainstorm how the features of their assigned environment impact human activities. Each group should note down key points.



Skill: 3.9

Annotation on map by marking major cities (Islamabad, Lahore, Peshawar, Karachi, Quetta, Gilgit and Muzaffarabad) on the map of Pakistan. Skill sheet will be provided via QR code.

v. Cultural Adaptations and Traditions

The diverse physical environment of Pakistan has shaped the cultural adaptations and traditions of its people. The use of adobe and mudbrick construction in arid regions, the development of irrigation systems in agricultural areas, and the construction of traditional dwellings adapted to local climates are examples of how communities have adapted to their surroundings.



Colorful embroidery
from Sindh

Traditional mudbrick houses

Doom-shaped houses
in Thar Desert

In conclusion, the physical environment of Pakistan has had a profound influence on human activities, cultural traditions, and the overall development of the country. From agriculture and pastoralism to trade and urban development, the country's diverse landscapes, climatic conditions and natural resources have shaped the way people live, work and interact with their surroundings.



Project 2

Introduce various geographical features, including mountains, plateaus, plains, deserts and coastal regions. Establish stations for each feature, complete with images/maps and concise descriptions. Students will rotate through these stations, taking note of key distinctions at each one. Afterward, students regroup and construct a comparison chart or visual representation for different regions, such as Northeastern vs. Western Mountain ranges, Potohar vs. Balochistan plateaus, Upper vs. Lower Indus plains, Thar, Thal, and Kharan deserts, and Sindh vs. Balochistan coastal regions. Groups then present their comparisons, highlighting notable differences and discussions are encouraged for further clarification.

Exercise

A Choose the correct option against each statement.

- 1** Which mountain range is the second-highest in the world and forms Pakistan's north-western boundary?
a. Hindu Kush **b.** Karakoram
c. Himalayas **d.** Nanga Parbat
- 2** Which plateau is located in northeastern Pakistan and is formed by the sedimentary rocks of the Salt Range and the Kala Chitta Range?
a. Potohar Plateau **b.** Balochistan Plateau
c. Northern mountains **d.** Western Mountain
- 3** Which plain is located in southern Pakistan and is formed by the alluvial deposits of the Indus River?
a. Upper Indus Plain **b.** Lower Indus Plain
c. Northern mountains **d.** Western Mountain
- 4** Which desert is located in southeastern Pakistan and is formed by the combined effects of monsoons and the Indus River?
a. Thar Desert **b.** Thal Desert
c. Kharan Desert **d.** Cholistan Desert
- 5** Which river is the main source of water for the Indus River Plain?
a. Indus River **b.** Sutlej River
c. Chenab River **d.** Ravi River
- 6** Which mountain range is the highest in the world and forms a substantial portion of Pakistan's northeastern border?
a. Hindu Kush **b.** Karakoram **c.** Himalayas
c. Karakoram Mountain Range **d.** Kirthar Range
- 7** Which rivers flow from the Himalayas into the Indus River, forming eastern tributaries?
a. Sutlej, Ravi, Chenab, and Jhelum Rivers
b. Kabul, Swat, and Kurram Rivers
c. Hab River, Dasht River and Pishin River
d. Gomul River, Tochi River and Kabul River
- 8** Which desert is located in southwestern Pakistan and is formed by the combined effects of high altitude and the rain shadow effect of the mountains?
a. Thar Desert **b.** Thal Desert
c. Kharan Desert **d.** Cholistan Desert
- 9** Which plateau is located in southwestern Pakistan and is formed by the igneous and metamorphic rocks of the Sulaiman Range and the Kirthar Range?
a. Potohar Plateau **b.** Balochistan Plateau
c. Upper Indus **d.** Lower Indus
- 10** Which plain is located in northeastern Pakistan and is formed by the alluvial deposits of the Indus River and its tributaries?
a. Upper Indus Plain **b.** Lower Indus Plain
c. Plateaus **d.** Mountains

B Write brief answers of the following questions.

- 1 Which mountain ranges form the northern borders of Pakistan?
- 2 Name two plateaus in Pakistan and identify their locations.
- 3 Differentiate between the Upper Indus Plain and the Lower Indus Plain.
- 4 What are the key distinctions between the Thar, Thal, and Kharan deserts in Pakistan?
- 5 Compare the mountains in the Northeastern and Western ranges of Pakistan in terms of characteristics.
- 6 Identify and explain the differences between the Potohar and Balochistan plateaus.
- 7 How does the physical environment influence settlement patterns and population density in Pakistan?
- 8 Discuss the economic activities associated with the coastal regions in Sindh and Balochistan.

C Write comprehensive answers of the following questions.

- 1 Explain the geological significance and features of the Hindu Kush, Karakoram, and Himalayan Mountain ranges in Pakistan.
- 2 Analyze the contrasting characteristics of the Potohar and Balochistan plateaus, considering their geological formations and ecological diversity.
- 3 Explore the unique features and adaptations of the Thar, Thal, and Kharan deserts in Pakistan, focusing on climate, vegetation, and human activities.
- 4 Analyze the geographical features and economic importance of the coastal regions in Sindh and Balochistan, exploring the role of ports and maritime activities.
- 5 Explore the ways in which the physical environment influences human activities in different regions of Pakistan, considering factors such as agriculture, trade, and cultural practices.