

Student's Learning Outcomes

After studying this chapter, students will be able to:

1. Identify the location of Pakistan with reference to its latitudes and longitudes and its neighbours, with the help of a physical map.
2. Describe the major landform features of Pakistan (Mountain ranges, Plateaus, Plains etc.)
3. Identify the major climatic regions of Pakistan and briefly describe the characteristics of every region.
4. Identify the location of major glaciers and rivers of Pakistan and highlight their importance.
5. Discuss major types of forests, their distribution, importance and protection.
6. Identify the wildlife of Pakistan, their habitat and efforts to protect wildlife in Pakistan.
7. Describe the characteristics of major natural Regions of Pakistan and human environment in them.
8. Discuss the nature and importance of environmental hazards of Pakistan and their associated problems and solutions.
9. Describe the problems associated with the conservation of water, land, natural vegetation and wildlife.

Location of Pakistan

Pakistan is situated in the continent of Asia. It is an important country of South Asia. The total area of Pakistan is 796096 square kilometers, which is 0.67% of the total area of the world. About 58% of the total land of Pakistan consists of mountains and plateaus, while about 42% area is covered by plains and deserts. Pakistan is a vast and spacious country stretching from the coast of the Arabian Sea near Indus river delta to the lofty mountain ranges in the north. The south eastern region of Pakistan is covered by the river plains, while the western and central region consists of several mountain ranges. That is why there is significant seasonal difference in Pakistan climate.

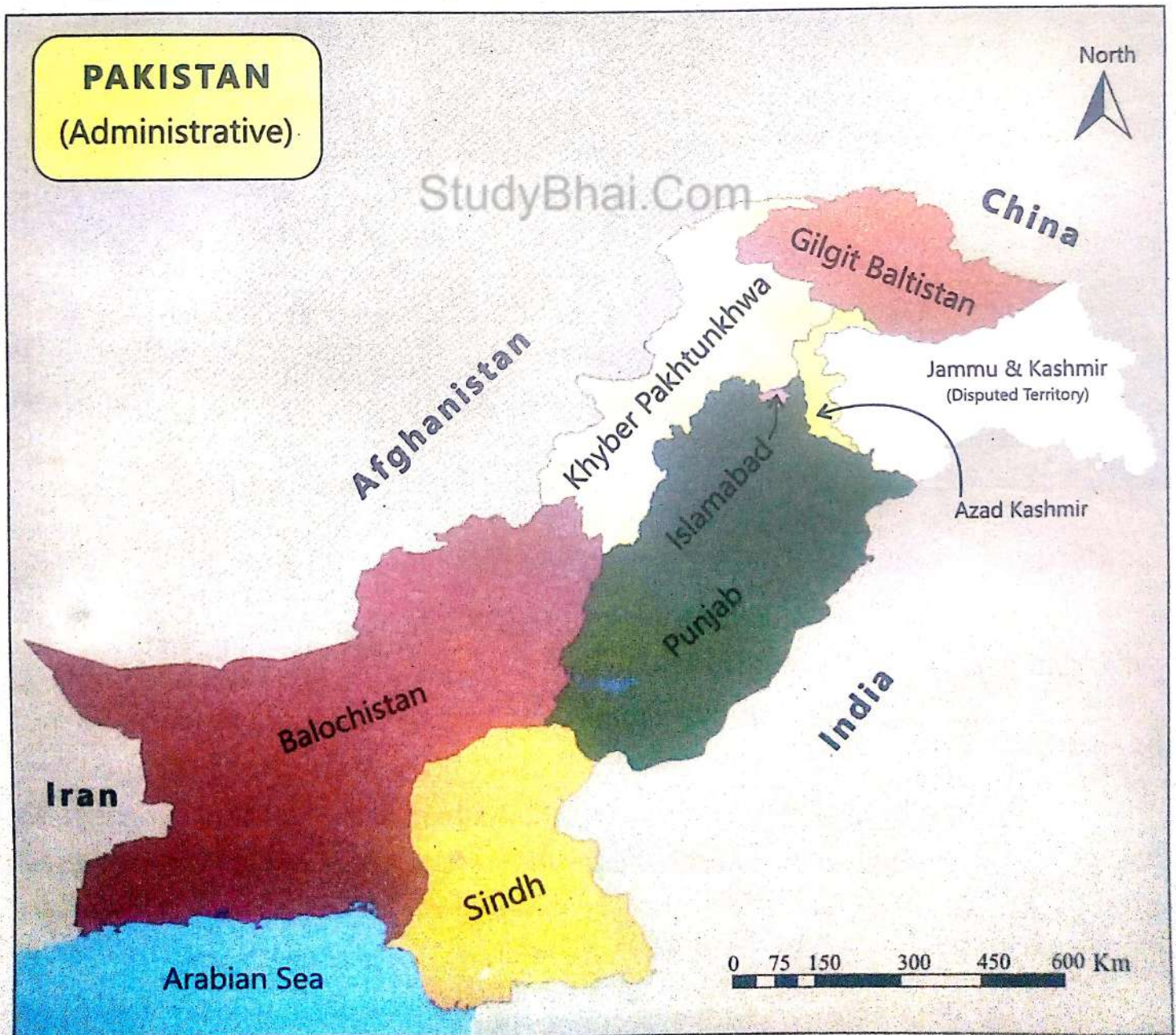
Pakistan is a fortunate country, in the sense, that Almighty Allah has blessed it

with a conducive environment. The physical environment impinges deeply on the economic, social, cultural and other activities of the people of a country. The physical environment refers to location, relief features and climate. Geographically, Pakistan is located between 24 to 37 degrees North Latitude and 61 to 77 degrees East longitude. Pakistan has China in the North. Afghanistan and Iran in the West, India in the East and Arabian Sea in the south.

Importance of Location

Pakistan has a special significance in the world due to its location, because Pakistan is an important means of communication between East and West.

1. Pakistan has China in its north, which is emerging as a major economic power on the world map. China has stood by Pakistan through thick and thin Pakistan is proud of China's friendship. China is working on several developmental projects



in Pakistan, including the China Pakistan Economic Corridor (CPEC). These projects are further strengthening the industrial, economic and social relations between the two countries and new doors are opening up for the development and prosperity of this region.

2. Pakistan has the Central Asian Islamic countries (Kazakhstan, Uzbekistan, Tajikistan, Turkmenistan and Kyrgyzstan) in the north west. These countries are land locked and rich in natural resources. Pakistan has religious, cultural and economic relations with these Islamic countries. Pakistan is the only country that provides the nearest sea route and transport facilities to Central Asian Republics.
3. Pakistan has Afghanistan and Iran in the west. The borderline with Afghanistan is called Durand Line. Pakistan has brotherly relations with these countries as well.
4. Pakistan has India in the East. There are tensions between Pakistan and India on Jammu and Kashmir and some other issues, but after the settlement of these issues there are bright prospects of cooperation between them.
5. Pakistan has the Arabian Sea in the south, which is a part of the Indian Ocean. Trade between the East and the West is mostly through the Indian Ocean. Therefore, being on an important trade route, Pakistan has a great significance. Pakistan is connected to the Muslim countries bordering the Persian Gulf via the Arabian Sea. All these Gulf countries are rich in oil. Due to the Persian Gulf, the Indian Ocean has always been the focus of attention among the major powers. Karachi, Bin Qasim and Gwadar are the main seaports of Pakistan.
6. In addition Pakistan has cordial relations with many countries through the Indian Ocean. These include South-East Asian Muslim countries (Indonesia, Malaysia, Brunei Dar-us-salam) and South Asian Muslim countries (Bangladesh, Maldives) and Sri Lanka.

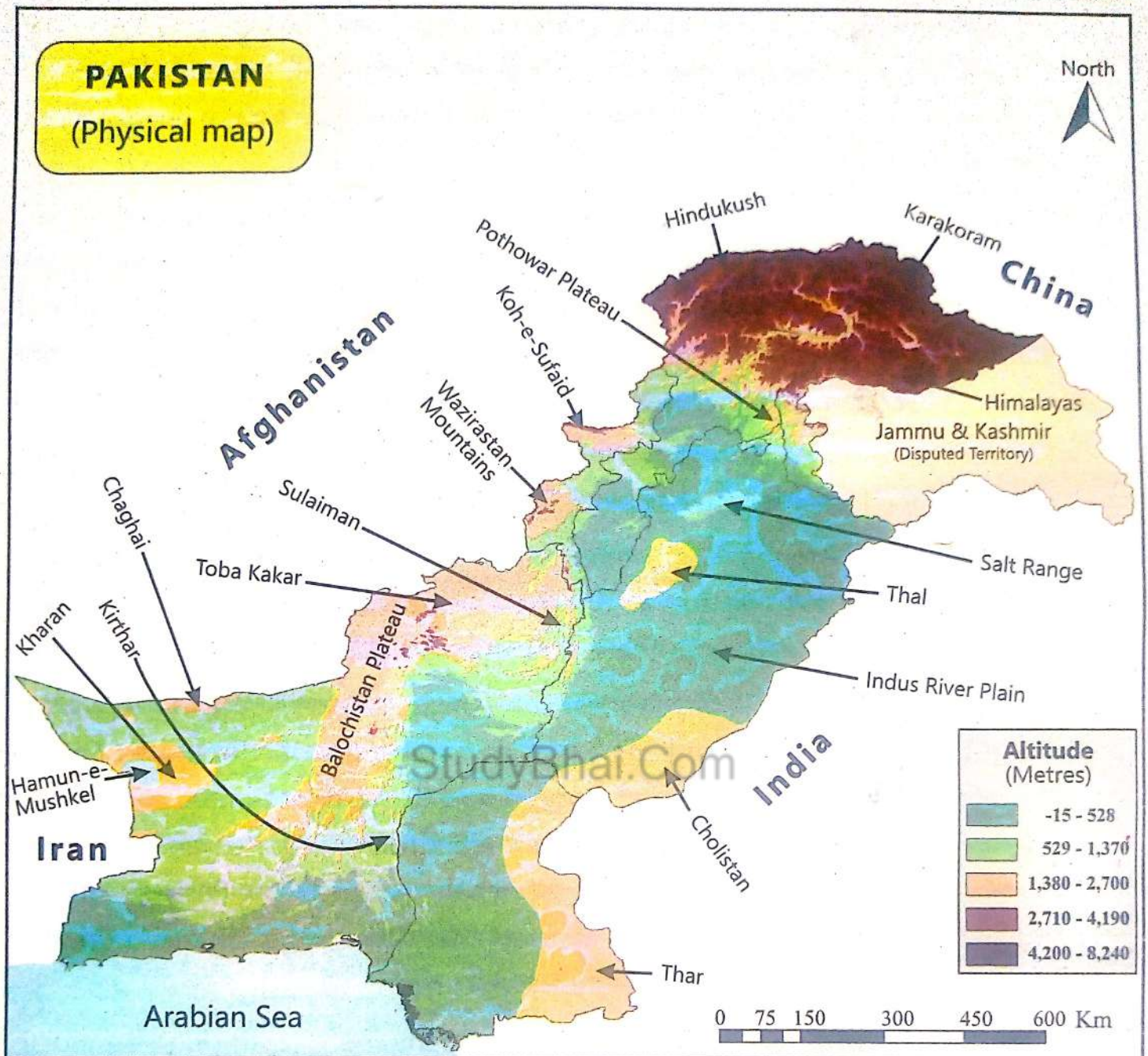
Physical Features of Pakistan

In terms of physical features, Pakistan is divided into three major areas:

1. Mountain Ranges
2. Plain Areas
3. Plateaus

1. Mountain Ranges

The part of the earth that is higher than the surface of the earth, has sloping sides around it, with rocky and uneven surface, is called a mountain. Pakistan has world's highest mountain ranges. Their division is as under:



- i. Northern Mountain Ranges
- ii. North Western Mountain Range
- iii. Western Mountain Ranges

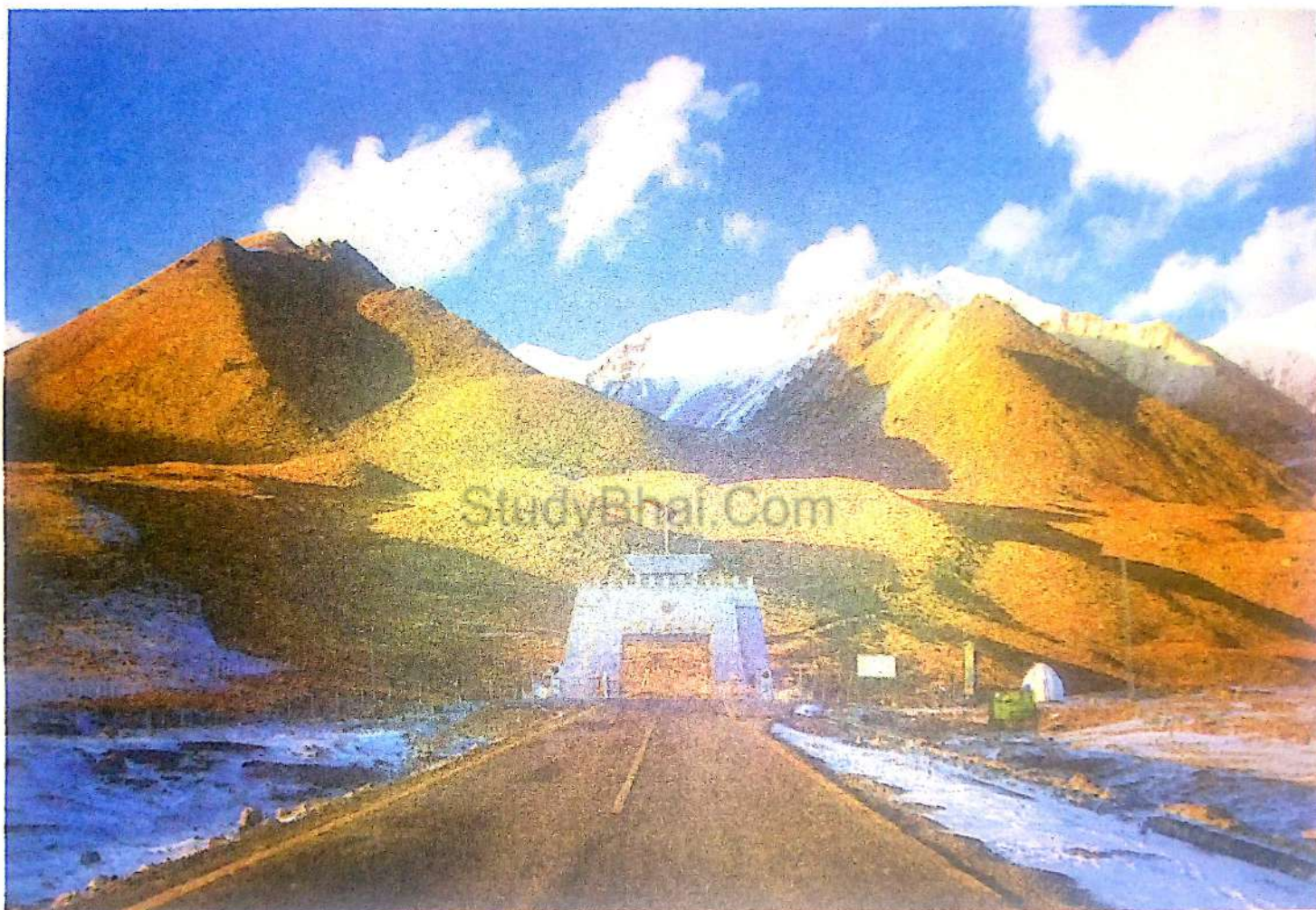
(i) Northern Mountain Ranges

The Himalayas and the Karakoram mountains are located in these mountain ranges.

Karakoram Range

This mountain range is located in the north of Pakistan. The world's second highest mountain peak K-2 is located in the same mountain range, that is 8611 metres

above sea level. The average height of the Karakoram range is 7000 metres. The rugged peaks of this range remain covered with snow all the year round. The world's highest passes such as Khunjrab and Shandoor are situated in this mountain range. Hunza and Gilgit etc. are beautiful valleys. With the on set of the summer season, life returns with full swing in these valleys. This mountain range lies between Pakistan and China. The construction of Karakoram highway or the Silk route has greatly benefitted both counties in trade and tourism.



Khanjrab Pass which connects Pakistan with China

Himalayan Range

The great Himalayan mountain range that is located South of Karakoram lies in the north of South Asia stretching from west to south-east with considerable east-west spread. The western part of this range is located in Pakistan. Its average height is 1000 meters to 6500 metres which includes hills of the Siwalik, the Lesser Himalayan mountain and the Greater Himalayan mountain. The highest peak of this range is Nanga Parbat, which is 8126 meters above sea level. The world's most beautiful valleys are located in these ranges, which include the important valley of Kashmir. The height of Himalayan

mountain range increases from south to north. These mountains are rich in natural resources and vegetation, especially the evergreen conical forests.



Nanga Parbat

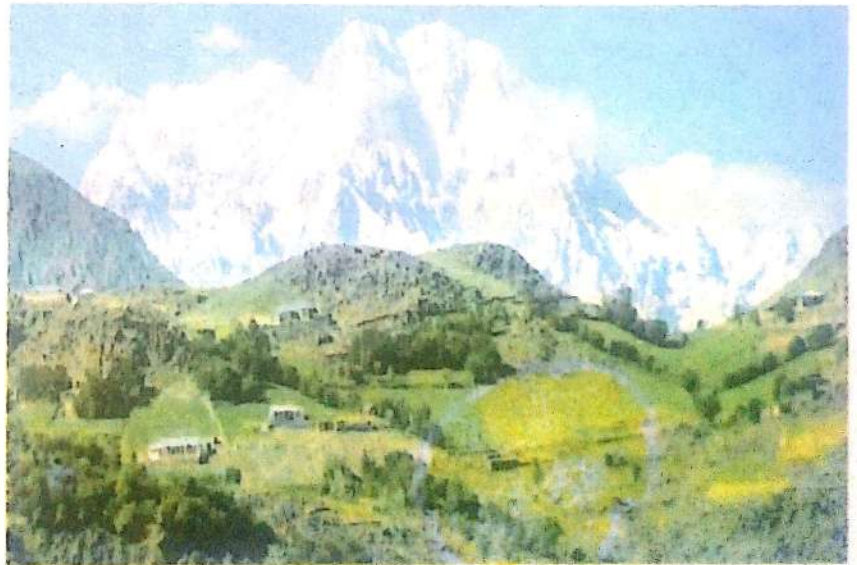
Do you know?

Mount Everest is the highest mountain peak in the world. Its height is 8848 metres, which is located in Nepal.

(ii) North Western Mountain Range

Hindukush Range

The Hindukush range is located in the north western part of Pakistan stretching from north to south. This mountain extends from Pamir plateau to river Kabul. This mountain range is mostly located in Afghanistan. Tirchmir is the highest peak of Hindukush, which is about 7690 metres high. The valleys of Chitral, Swat, and Dir are located in this mountain range.



Tirchmir

(iii) Western Mountain Ranges

Koh-e-sufaid

Koh-e-Sufaid lies to the south of river Kabul and is spread in east-west direction.

The average height of this mountain range is 3600 metres. Khayber pass lies to the north of Koh-e-Sufaid. Khayber pass is a historical passage between Pakistan and Afghanistan, which is about 53km long. River Kurram flows in the south of the Koh-e-Sufaid.

Waziristan Hills

Kohat and Waziristan hills are located in the south of Koh-e-Sufaid. These are different hill ranges. The Kurram, Tochi and Gomal are important passes of these hills. These hill ranges located between river Kurram and Gomal stretch from the north to south. River Tochi is another important river of these hill ranges. The valleys of these rivers are important passes for development of trade and cultural ties between Pakistan and Afghanistan. In the south of Waziristan hills lies Toba Kakar range near Afghanistan border.



Gomal River

Koh-e-Sulaiman

Koh-e-Sulaiman extends from north to south in the south of Waziristan hills. This mountain is situated in the middle of Pakistan. The highest peak of this range is



Koh-e-Sulaiman

Takht-e-Sulaiman, which is 3443 metres above sea level. River Bolan is an important river of this range. In the south of Koh-e-Sulaiman range there are Bugti and Marri hills. The Bolan Pass is located in the same mountain range.

Kirthar Hills

Kirthar Hills are situated in the west of river Indus along the borders of the provinces of Sindh and Balochistan. These hills extend from north to south. The maximum height of the Kirthar Hills is 2150 meters. The rivers Hab and Layari flow from Kirthar Hills towards the Arabian Sea.



National Park Kirthar

Salt Range

The Salt range lies in the south of Pothwar plateau. River Jhelum flows in the east of Salt range. The average height of the Salt range is 700 metres. But at Skesar its height is 1500 metres. The river Soan is a famous affluent of this area.



Kalar Kahar Salt Range

2. Plain Areas

The Plain of river Indus is composed of the soil brought by the river Indus and its tributaries Jhelum, Chenab, Ravi and Sutlej. In Pakistan the plain area of the Punjab province, is called upper indus plain. It is named Punjab because five rivers namely Indus, Jhelum, Chenab, Ravi and Sutlej irrigate it. River Indus is the most



Plain Area

important and the longest river of Pakistan. Upper Indus plain is almost level and is made up of soil deposited by the rivers. Therefore, the soil is very fertile. The shortage of rainfall is met with artificial sources of irrigation like tube wells and canal water. Immediate and essential irrigation produces better crops.

Do you know?

About 80% of the world's population is found in the plains.

The lower Indus plain is a levelled plain with a gentle slope. It is irrigated by river Indus alone. The lower Indus plain is very important for agriculture. The Thar desert lies in the south east of this plain. The delta region of river Indus starts from Thatta and is divided into many branches or distributaries that fall into the Arabian Sea. The plain areas also include Coastal plains and Deserts.

(i) Coastal Plains

Pakistan coast is about 1050 km long. The coastal belt starts in the east from the border of Sindh province with India and extends along the coast to the border of Iran in the west. Coastal plain has small and big sea-ports out of which Karachi is the most important sea-port. Other important ports are Bin Qasim, Pasni and Gwadar. Fishing industry is progressing in these areas, so this coastal plain is the centre of important economic activities.

(ii) Deserts

The south eastern part of Pakistan has desert like characteristics. It is spread over a large area, which includes the districts of Bhawalpur, Sukkur,



Makran Coastal Highway



Thar

Khairpur, Sanghar, Mirpur Khas and Tharparkar. This desert is called "Cholistan" or "Rohi" in Bahawalpur, and "Thar" in Sindh. Due to scarce rainfall desert plants are found in this area. Most of the area is unpopulated.

"Thal" is the second desert of Pakistan. This desert lies between River Jhelum and River Indus. It is mostly unpopulated. The third desert of Pakistan is situated in the north west of Balochistan province, which is called the desert of Kharan. Some part of Chaghi is also included in it.

3. Plateaus

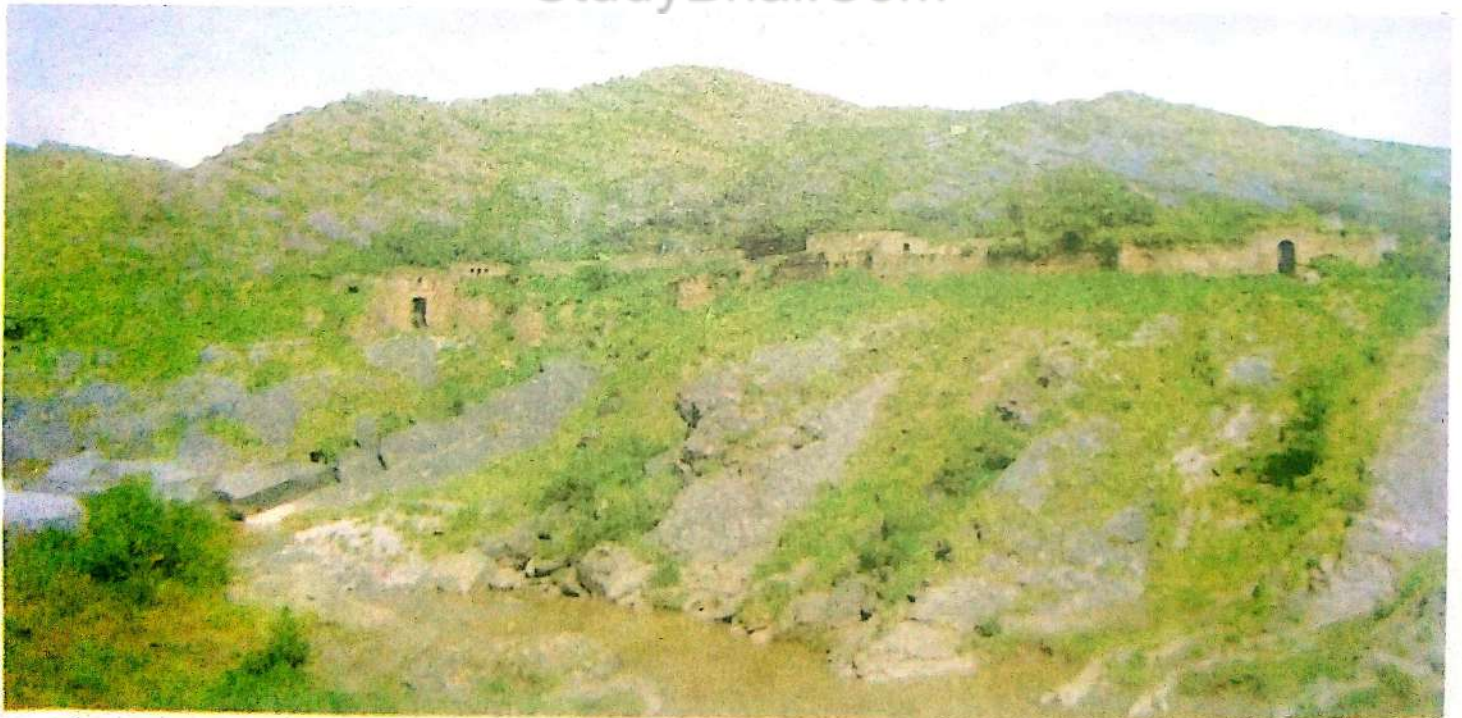
The plateau has an ups and downs character. There are mountain ranges, plains and river valleys on a plateau.

Do you know?

Pamir plateau is the highest plateau in the world which is also called the roof of the world.

(i) Pothwar Plateau

Pothwar plateau has Kala-Chitta and Margalla hills in the north, Salt range in the south, river Jhelum in the east and river Indus in the west. This plateau is 300 to 600 metres high. River Soan is an important affluent of this plateau with a beautiful valley called "Valley of Soan". The surface of Pothwar is badly cracked.



Pothwar

(ii) Balochistan Plateau

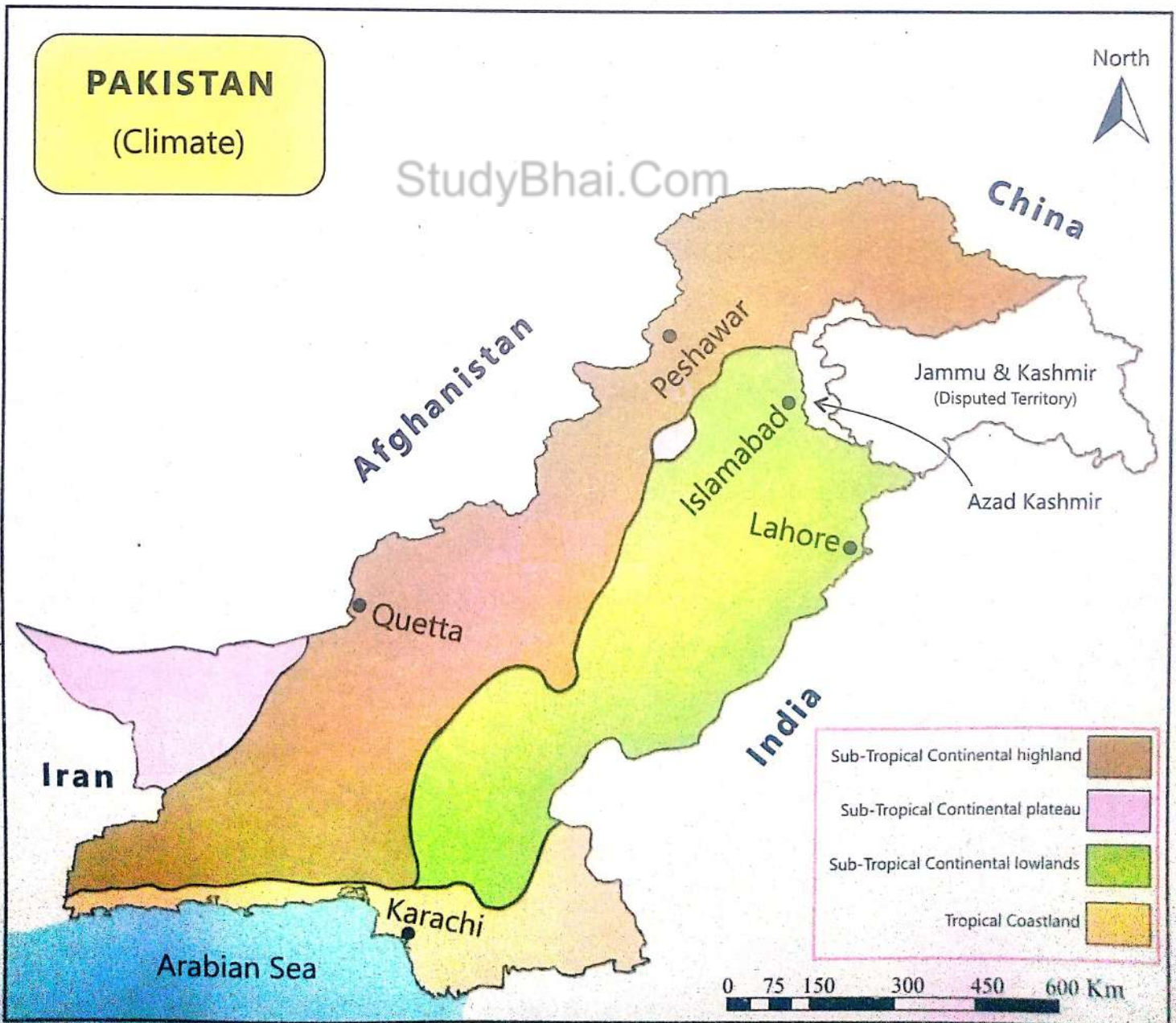
Balochistan plateau lies in the west of Koh-e-Sulaiman and Khirthar Range. Its maximum height is 900 metres. Baluchistan Plateau is an arid region having very low rain fall. Therefore, this region has desert characteristics. In the north of this plateau, the

mountain ranges of Toba Kakar and Chaghi are situated. In the western part of Balochistan, there are salt lakes, among them the famous one is Hamun-e-Mashkel. The important rivers of this plateau are Gomal, Zhob and Hingol.

Climate of Pakistan

The long term study of weather conditions of any country or area is called climate. The weather conditions include temperature, air pressure, rain and humidity etc. Pakistan is divided into following climatic regions:-

1. Sub-Tropical Continental highland
2. Sub-Tropical Continental plateau
3. Sub-Tropical Continental lowlands
4. Tropical Coastland



1. Sub-Tropical Continental Highland

This climatic region includes Pakistan's northern mountain ranges (outer and central Himalayas), north western mountain ranges (Chitral, Swat and Dir etc.), Western mountain range (Waziristan, Zobe and Loralai) and the mountain ranges of Balochistan (Quetta, Sarawan, Central Makran and Jaliwan). Here the winter is extremely cold and normally there is snow fall. Summer season is quite cool while in spring season there is rainfall.

In some areas of this region such as outer Himalayas, Muree and Hazara districts, rainfall continues almost throughout the year. But mostly the rain falls at the end of the Summer season.

2. Sub-Tropical Continental Plateau

This climatic region includes most Balochistan. Hot and dusty winds continuously blow there from May to the mid September. Sibbi and Jacobabad are located in this very region. There is some rainfall during the months of January and February. Extreme hot weather, dry and dusty winds are important characteristics of this region.

3. Sub-Tropical Continental Lowland

This climatic region includes the upper Indus plain (Punjab province) and lower Indus plain (Sindh province). Summer is very hot in this region and towards the end of summer northern Punjab receives more rainfall due to monsoon winds, while plain areas receive less rainfall. Winter rainfall pattern is also the same. Thal and the Southeast desert are the driest areas that receive very little rainfall. Peshawar plain experiences thunder storms rain and dust storms. During summer, dust storms are very common in Peshawar.

4. Tropical Coastland

This climatic region includes the coastal areas of Sindh and Balochistan provinces. The difference between maximum and minimum range of temperature is small. There is inflow of sea breeze throughout the Summer, the humidity is high and annual average temperature is 32°C. May and June are the hottest months. The plain of Lasbela receives rainfall both in Summer and Winter seasons.

Impacts of Climate on Human Life

- Climate affects the human life considerably. It affects all the human activities of a place or an area. The economic, social, cultural and political activities of the people of any country depend to a great extent on climate. The dress, living, food

etc., of the people of cold areas are different from the people of hot areas. Similarly, all other activities of trade and commerce also differ.

■ The northern and north western areas of Pakistan are surrounded by mountain ranges. These areas are thousands of metres high above sea level. The temperature decreases with increase in height. The temperature of the hilly areas in winter is extremely low and falls below freezing point (0°C) and mostly there is snowfall. The activities of all the people living here are almost limited in winter. People store food and other necessary items to meet the needs of the Winter season. Home crafts are very important in people's activities. Some people shift their cattle, sheep, goats etc. from highlands to the lowland areas because all the grazing fields get covered with snow. These areas become green in the Summer season. The drains and rivulets start flowing when snow melts and the people of these areas go back to their lands with their belongings and livestock. During Summer, farming is an important occupation of the people of these areas. Different types of fruits grow in this area, therefore, the economic and commercial activities start again.

■ Hilly areas are relatively less populated. Mineral resources are also found in these areas. The people of these areas are hardworking and energetic. The climate is relatively good, so tourism has progressed a lot.

The climate of plains of Pakistan is extreme, that is Summer is very hot and Winter is very cold. This climate is quite suitable for different kinds of crops, vegetables and fruits. As the plain areas are made of soil brought from rivers, therefore, they are very fertile. Agriculture and the related industries are the major source of income of the people of these areas. The economic condition of the people is relatively better.

Climate has a deep impact on the living, food and dress of the people. The deficiency of rainfall is made up by irrigation system in plain areas. These areas are densely populated. Pakistan has maximum population in these areas. The means of transportation and communication are relatively better, and the people have all the facilities of life.

■ The climate of desert areas of Pakistan is very hot and dry. There is considerable difference of temperature between day and night. During the day Loh (hot wind) and dust storm blow in Summer. The south of Punjab and north and south of

Sindh province have desert like characteristics. The life of the people of these areas is very hard. There is less rainfall, therefore, drinking water is brought from distant places. Life is somewhat comfortable in areas where there is availability of canal water. Rearing of sheep and goats is the major source of earning for the people of these areas.

- In Pakistan the climate of Balochistan plateau is the hottest in summer and the coldest in winter. Snow falls at some high-altitude areas during winter. This is the driest region of Pakistan. The winter snow is an important source of water. During summer, the depressions and small rivulets get filled with water therefore there are lakes and seasonal streams in this area. In hilly areas the rain water is stored and transported from one place to another through underground channels called Karez. As the climate of Balochistan is generally hot therefore, these underground channels or drains are very important and save water from evaporation. Resultantly, farming has started in this area. Here, the income of the people mostly depends on rearing of cattle and herd. This area is rich in fruit production and mineral resources. People's livelihood depends on the availability of local resources.

Major Glaciers and Rivers of Pakistan

Glacier

A large mass of frozen ice in mountain valleys that moves down the slope is called glacier. Glaciers form in areas of high altitude, due to low temperatures and snowfall. When the ice remains frozen continuously, ice at the bottom hardens and begins to slide toward lower elevations. Resultantly, the glacier moves. Pakistan is located in the sub-tropical climatic zone which does not usually get much cold and rain. But the northern and northeastern areas of Pakistan with the highest mountains of



Glacier

the world like Himalayas, Karakoram and Hindukush remain covered with snow the whole year. There are some of the largest glaciers of the world in these mountain ranges, including major glaciers like Siachen, Baltoro, Biafo, Batura and Hispar glaciers, etc.

Siachen Glacier

The word Siachen is taken from the Balti language, which means wild rose. This plant grows in large number on this glacier, so people of Baltistan call it Siachen. Its length is 70 km. It is located in Karakoram range.

Baltoro Glacier

Baltoro Glacier is located in Baltistan. Its length is 62 km. The famous K-2 peak is also located in the same glacier. The Braldu River also originates from the same glacier and falls into River Indus. This glacier can be accessed from Skardu City.

Batora Glacier

Batora Glacier is 54 km long. It is located in Gojal Valley in Gilgit Baltistan.

Do you know?

Glaciers are the largest resource of fresh water in the world.

Biafo Glacier

Biafo Glacier is located in the mountains of Karakoram range. Its length is 63 km and is connected with Hisper Glacier which is located in Hunza Valley.

Hisper Glacier

Hisper Glacier is located in Baltistan area of northern Pakistan. This glacier is 49 km long. The river Hisper originates from the same glacier.

Importance of glaciers

The mountains of Karakoram Range located in Pakistan are one of the most glaciated areas in the world. The fresh water of these glaciers flows into rivers, in the form of springs and drains. The rivers which flow in Pakistan originate from these glaciers. In addition, several fresh water lakes have been formed in these mountain ranges due to the degradation (melting) of glaciers, which meet the local needs of water. Out of these, Saiful Muluk, Satpara and Shandur are the important lakes. These lakes have greatly enhanced the beauty of this area, which makes this area attractive for tourism. In addition, these lakes also support aquatic life in this area.

The rivers of Pakistan

The system of rivers in Pakistan is based on the eastern and western tributaries of river Indus which consist of the rivers of Punjab, Gilgit Baltistan, Khyber Pakhtunkhwa,

Sindh, Balochistan and Azad Jammu and Kashmir. These rivers irrigate the land of our country.

River Indus and its Tributaries

River Indus is the largest river of Pakistan that irrigates a large area of the Punjab as well. This river originates from Tibet (China) and flows through Gilgit-Baltistan and enters Punjab at Attock. There after it flows from north to south and enters Sindh. The rest of rivers of the Punjab join river Indus at Mithan Kot. From here, river Indus flows to the south through the province of Sindh and falls into the Arabian Sea. Many tributaries of the River Indus join from the right and left. The rivers that join river Indus from the left are called the eastern tributaries because they mostly come from the east.



Satellite View of Indus River

Eastern Tributaries of River Indus

i. River Ravi

River Ravi originates from the mountains of Kashmir. This river flows through Indian territory and enters Pakistan near Lahore. Lahore, the capital of the Punjab, is situated on the bank of River Ravi.

ii. River Sutlej

River Sutlej originates from the Himalayas and flowing through Indian territory enters Punjab province near Sulemanki. Then flowing through the eastern areas of

Do you know?

As per the Indus Water Treaty of 1960, three rivers; Indus, Chenab and Jhelum were given to Pakistan while Ravi, Sutlej and Beas were given to India.

Punjab joins other rivers of Punjab.

iii. River Chenab

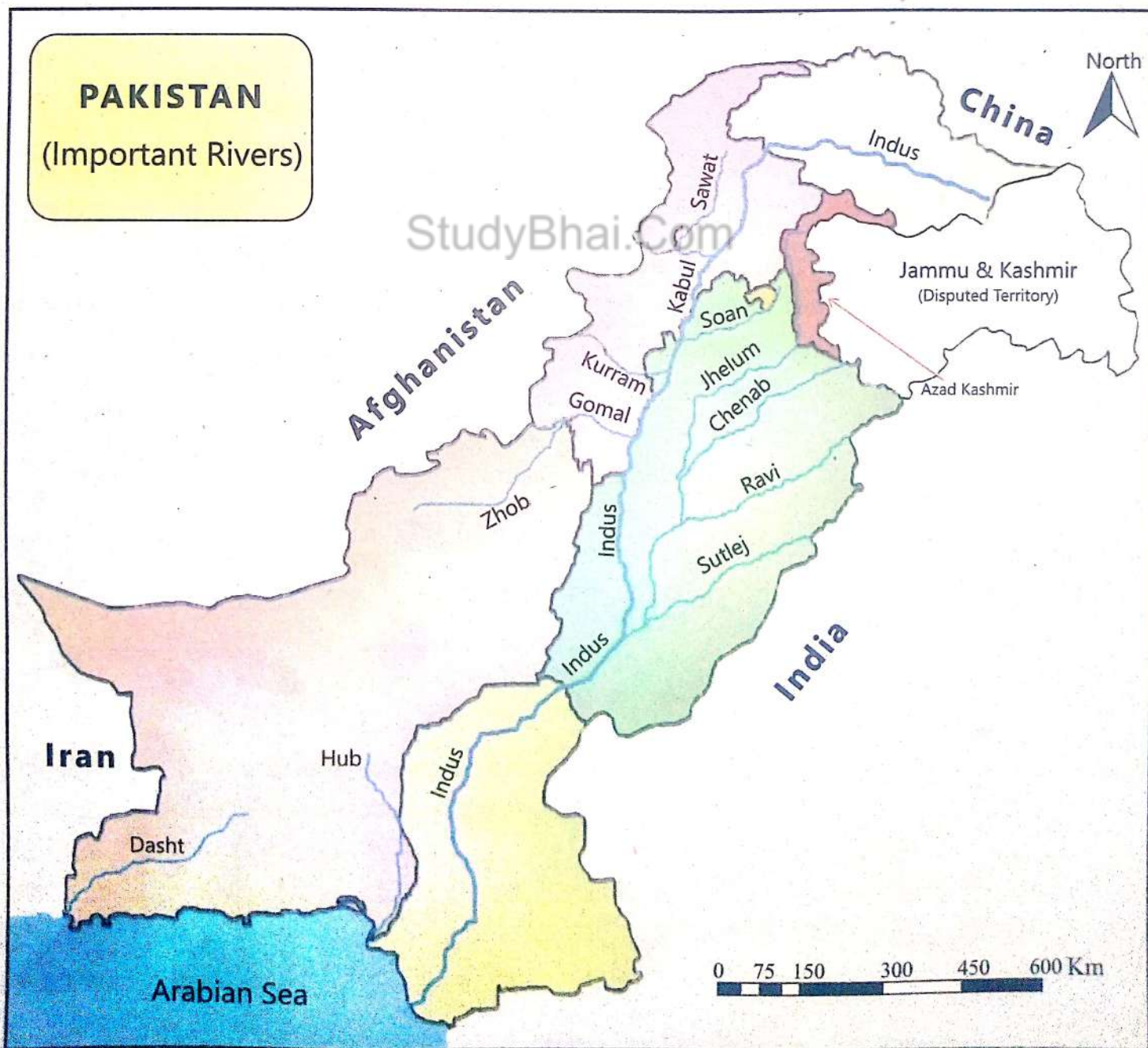
River Chenab originates from the Himalayan mountains and enters Punjab province at Marala. River Chenab joins River Jhelum at Tarimon.

iv. River Jhelum

River Jhelum flows out of Kashmir Valley and enters Punjab province near Mangla.

Do you know?

The area between rivers is called Doaba. There are several Doabs in Pakistan. Bari Doab has river Ravi on one side and river Bias on the other. The area between river Ravi and river Chenab is called Rachna Doab. The area between river Chenab and river Jhelum is known as Chaj Doab, while the area between river Indus and river Jhelum is called Sindh Sagar Doab.



Western Tributaries of River Indus

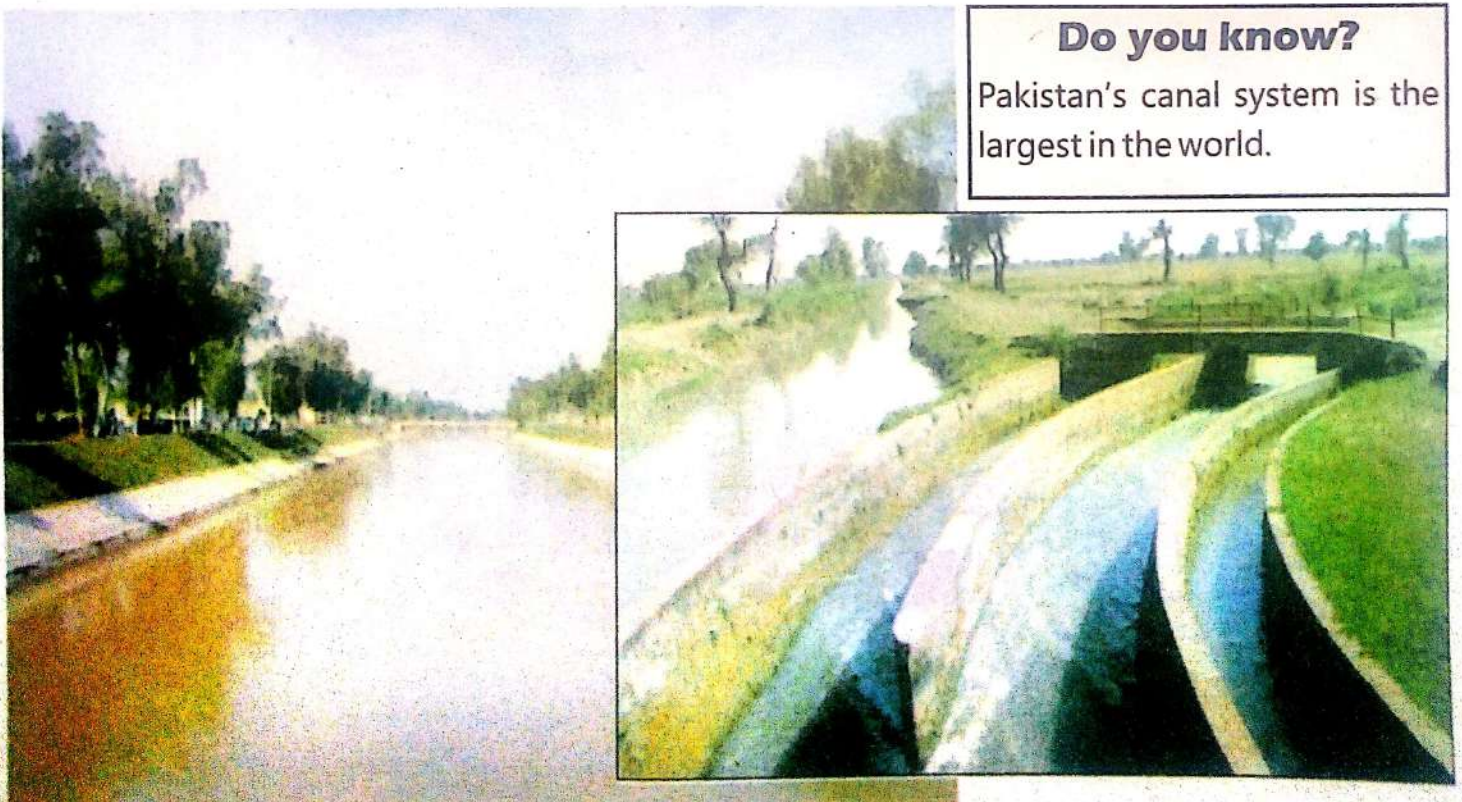
The rivers flowing from north and west and falling into River Indus are called its western tributaries. River Sheoak, River Shigar and River Gilgit emanate from the northern mountainous regions and fall into River Indus. River Kabul falls into the River Indus at Attock. River Kabul is a large river that originates from Afghanistan and flows towards East to enter Pakistan. Its major tributaries are River Panjgur, River Swat and River Kunar. River Kurram, River Tochi and River Gomal also flow from West and fall into River Indus. River Zhob flows through Zhob and Loralai areas of Balochistan and joins Gomal which is a tributary of River Indus. River Zhob is the only river that flows from south to north.

The Rivers of Balochistan falling into Arabian Sea

The Rivers of Balochistan namely Dasht, Hangol, Porali and River Hub flowing from north to south fall into the Arabian Sea. The largest lake in Balochistan is "Hamun-e-Mashkel".

Canals of Pakistan

At the beginning of the nineteenth century, the British government constructed modern canal system in the sub-continent, which is the largest canal system in the world. Under this system, large dams and headworks have been constructed at different places on the five rivers from which canals have been taken out. There are four types of canals in



Do you know?

Pakistan's canal system is the largest in the world.

Canal

Pakistan.

i. Flood Canals

These are the canals in which the water enters through flood or when the water level in the rivers is high. These canals do not have headworks. In the rainy season, the canals start flowing automatically as the rivers rise. The flood canals are mostly found in the districts of Rajanpur, Dera Ghazi Khan and Muzaffargarh.

ii. Perennial Canals

These canals have been taken out by constructing dams on rivers and flow throughout the year. The river water can be diverted by the headworks and discharged into the canals as per requirement. These canals are connected to dams, barrages or headworks and provide water for irrigation over the year.

iii. Non-Perennial Canals

These canals run in rainy season when water is sufficient in the rivers. They provide water for the Kharif crop. Like the perennial canals, non-perennial canals also have headworks through which water can be diverted. These canals do not provide water for Rabi crop due to shortage of water in the rivers. These canals are also called half-yearly canals (six-monthly canals).

iv. Link Canals

Two rivers of Punjab province i.e. River Sutlej and River Ravi pass through Indian territory before entering Pakistan. India has drawn canals from these rivers, resulting in water shortage in these rivers. Pakistan has met this water shortage through link canals. These canals have been taken out from river Indus, river Jhelum and river Chenab which provide water to river Ravi and river Sutlej.

Forests

Due to variation in climatic conditions Pakistan has the following types of forests.

1. The northern and northwestern parts of Pakistan receive more rain as compared to the other areas of the country. These include Murree, Abbotabad, Mansehra, Chitral, Sawat and Dir. These areas have evergreen forests consisting of deodar, firs, blue pine, spruce, chilgoza trees, oak, chestnut and walnut trees. These trees produce high quality timber and fruits.

Do you know?

The largest dense forests of the world are called Roof Gardens found near equator.

2. In the foothill areas of districts of Peshawar, Mardan, Kohat, Attock, Rawalpindi, Jhelum and Gujrat, the forests consist of phulai, kao, jand, acacia, wild olive, black berry trees, etc.
3. Quetta and Kalat divisions of Balochistan have mostly thorny bushes, mazoo, chalghoza and poplar trees.
4. In plain areas some forests are found in the river valleys having *sheesham*, *poplar*, mulberry, sumbal, Jamun, dharek and eucalyptus trees. These areas include Changa Manga, Chichawatni, Khanewal, Toba Tek Singh, Burewala, Shorkot, Bahawalpur, Taunsa, Sukkar, Kotri and Guddu.

Importance of Forests

1. The northern mountainous areas of Pakistan receive more rain and water flowing from the hilly slopes drops into rivers. The forests on the slopes of hills regulate the flow of water, which not only stops soil erosion but also slows down the speed of water.
2. In Pakistan energy resources are limited therefore the forest wood meets the deficiency of coal. This wood is used as fire wood or for generating power.
3. Forests wood is used for making furniture or other items. Therefore forests are important for country's trade.
4. Forests make the climate of an area pleasant. They lower the temperature and reduce intensity of heat. Forests are helpful in reducing environmental pollution, especially smog.
5. Forests are instrumental in causing rainfall to a great extent, because, their presence increases the amount of water vapours in the air which causes rain.
6. The roots of the trees keep the soil intact and stop the soil erosion. Thus soil fertility remains unaffected.
7. In the absence of forests, the rivers carry huge amount of sand and silt that can fill the dams and artificial lakes and destroy hydroelectric power projects.
8. Trees are very useful in water logged and salinity affected areas, as they absorb water from the soil and lower water level of underground reserves.
9. Forest herbs are used for the preparation of medicines.
10. Forests promote tourism. There are many places in the northern and northwestern mountainous areas of Pakistan which are recreational resorts because of forests.
11. Forests are very important for the wild life (animals and birds).

12. Forests provide us various fruits and fodder for animals.
13. Forests have an important role in the economy of Pakistan as millions of people depend on forests to earn their livelihood.
14. Forests support resins and silk industry and also provide mushrooms, honey and wax.
15. Forest provide raw material for pulp and paper industry.

The government of Pakistan has taken various steps to increase the forests. The Forest Department is active in this respect. Nurseries have been established in almost all the big cities, where plants are available at nominal rates.

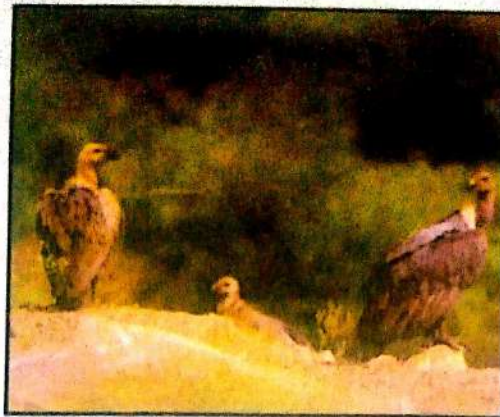
Wildlife in Pakistan

The presence of wildlife in any country is very helpful in maintaining the natural balance. Numerous animals are found in the forests of Pakistan, however, the animals found in the mountainous and desert areas of Pakistan are worth mentioning. Monkeys, wild cats and bears are found in large number in the northern areas and in high hills of Pakistan. In South Punjab blue cows, wild cats, jackals, partridges, snakes, peacocks and chinkara deer are noteworthy.

Red foxes, black deer, leopards, partridges and chakors are found in low-sloping mountains. Forests



are in abundance in Pothwar Plateau, Salt Range and Kala Chitta Mountain. A large number of wild animals are found in these forests including the urials, chinkara deer, partridges, peacocks, chakors and regional birds. chakor is the national bird of Pakistan while Markhor is the national animal of Pakistan.



Deer, blue cows, desert foxes, jackals, cats, black and gray partridges, cobras, snakes and ostriches are also found in the desert areas of Thal and Cholistan. Among hunting birds, falcon, kestrel, hawk and vultures are commonly found in Pakistan. Other than these birds, many seasonal birds migrate from Siberia and other cold areas to the lakes of Pakistan every year. When the winter is over, these birds return to their original areas.

Alongwith forests, the animals found in them are also important because they balance our environment. So, we must protect them as well.

Do you know?

Endangered animals are the animals that are nearing extinction, such as polar bears, Indus dolphin, black deer, etc.

Natural Regions of Pakistan

The vast area of Pakistan is not uniform. Each region is different in terms of climate, vegetation, people's living conditions and surface conditions. It can therefore, be divided into different natural regions on the basis of uniformity of topography.

"The natural region refers to a region in which weather, vegetation, population and living conditions of the people are the same". Or "the natural region means the area

of the land in which the elevation of the surface, depth, temperature, rainfall, vegetation, livestock and human activities are almost the same". Pakistan can be divided into five regions by natural topography:

1. Plain Region
2. Desert Region
3. Coastal region
4. Arid and Semi Arid Mountain Region
5. Humid and Sub Humid Mountain Region

The details of these regions are as under:

1. Plain Region

i. Areas

Plain region of Pakistan consists of Upper Indus Plain in the province of Punjab, Lower Indus Plain in the province of Sindh and plain area of Peshawar and Khyber Pakhtun khwa.

ii. Climate

The climate of plain region is very dry. The summer season is very hot and the winter season is cold. The average summer temperature is 40 degrees Celsius while the average winter temperature is 10 degrees Celsius. Rainfall in this area is mainly due to monsoon winds during the rainy season. The average annual rainfall in the region is 38 to 50 centimeters.

iii. Vegetation

Plain region receives more rainfall, so there are more forests. Thorny forests are commonly found here.

iv. Economic Conditions

Plain region is composed of highly fertile soil brought by the rivers. In addition, the canal irrigation system is also excellent. So, this region is famous for its agricultural production all over the world. The major crops of this region include rice, wheat, sugarcane and cotton. This region is playing an important role in the industrial development of the country. Most of the industries of the country are located in this region. Important industries include textile, electronics, electrical equipment, sports equipment, sugar industry, leather industry and cutlery industries. Industrial cities include Lahore, Faisalabad, Gujranwala, Peshawar, Gujarat, Multan, Kasur, Sialkot, Nawab Shah, Mardan, Nowshera and Sukkur.

Province. In this region the main areas of Sindh province are Thatta, Badin and Karachi. and that of Balochistan province are Lasbela, Gwadar, Pasni, Turbat and Panjgur.

ii. Climate

In coastal region, the climate is mild. Due to the adjacent sea, there is not much difference between summer and winter temperature. The average temperature in the summer is 30 degrees Celsius, while in winter the average temperature is 15 degrees Celsius. The coastal region remains humid throughout the year, while land breeze and sea breeze are important features of this region, which keep the climate mild. This region also receives less rainfall. The average annual rainfall is 30 centimeters.

iii. Vegetation

Coastal region has fewer forests. Due to less rainfall, coconut trees are not as common here as in the coastal areas of the rest of the world. The mangroves are abundant in the coastal areas.

iv. Economic Conditions

Being coastal region, fishing is the main occupation of this area. Small ports on the coastal belt of Balochistan are Pasni, Jiwani and Gadani which are famous for fishing. The development of the Gwadar port in Balochistan has begun a new era of prosperity. The main occupation of the people of the coastal rural area of Sindh is fishing. Karachi has the status of an international port, so it is the centre of trade activities in the world. Besides this, Karachi is a big industrial city and people from all parts of the country are associated with different types of jobs here. Karachi is the largest industrial city of Pakistan.

v. Population

The coastal region is densely populated. Karachi is the most populous city and port of this region. Its population is more than 15 million. Other ports like Port Qasim, Gadani and Gwadar have more population of fishermen.

4. Arid and Semi Arid Mountain Region

Arid Mountain Region

i. Areas

Arid mountainous region consists of Pakistan's western mountain ranges and plateau of Balochistan. This region covers the former tribal areas, the southwestern districts of Khyber Pakhtunkhwa, Dera Ismail Khan, Tank, Bannu, Kirk, Kohat and entire Balochistan province except the southern coastal areas and eastern Sibi and Jafarabad.

ii. Vegetation

There are very few forests in this region. Some fruit orchards and different crops are cultivated on a limited scale.

iii. Climate

The climate of Arid region is extremely severe and dry. The summer season is extremely dry and hot. In most of the areas, the average temperature remains 35 degrees Celsius in summer and 7 degrees Celsius in winter. Most of the mountainous areas get snowfall. Rainfall in this region is mainly in winter due to western cyclone whereas there is little rainfall in summer. Hence, forests are scarce, but there are lot of pastures in this area. Annual rainfall in this region is less than 30 centimeters.

iv. Population

This region is not densely populated. The rural population is more than the urban population. The literacy rate of this area is higher than that of the rest of the regions. The major cities of this region include Islamabad, Murree, Abbottabad, Mansehra, Swat, Hunza, Gilgit, etc.

Semi Arid Mountain Region

i. Areas

The Semi Arid mountain region generally consists of the mountain ranges of the Salt Range, Kala Chitta Mountain, Koh-e-Suleman, and Kirthar Mountain.

ii. Climate

Summer season is hot and long. There is an annual rainfall of 30 to 38 centimeters.

iii. Vegetation

This area is very famous for its fruit production. Maize, Sorghum, gram and peanuts are the main crops here.

iv. Population

The population of this region is scarce. The rural population is more than the urban population.

5. Humid and Sub Humid Mountain Region

Humid Mountain Region

i. Areas

The humid mountain region includes Murree in Punjab and Abbottabad,

Mansehra and Hazara etc. in Khyber Pakhtunkhwa.

ii. Climate

Summer is pleasant and winter gets severe cold. The annual rainfall here is more than 125 centimeters. In summer the temperature is about 26 degrees Celsius and the winter temperature is zero degree Celsius or less.

iii. Vegetation

This area is covered with different types of vegetation. Various types of fruits are produced in abundance in this area.

iv. Population

This region is densely populated. Its urban population is in majority.

Sub Humid Mountain Region

i. Areas

The sub humid mountain region includes the areas of Kohat, Swat, Chitral and Kashmir.

ii. Climate

There is not much rainfall in this area. Annual rainfall is about 50 centimeters. The summer is not hot and the winter is cold.

iii. Vegetation

Many types of vegetation is found in this region. There is limited production of crops and fruits.

iv. Population

This region is not densely populated.

Major Environmental Hazards and their Remedies

“Environment means the surroundings or conditions in which a person, animal or plant lives or operates. The environment, including landforms, climate, soil and natural vegetation, etc. has a deep impact on human life. Environment also impacts all activities of human beings in a region whether these are economic, political, social, religious, or financial. Environmental hazards are such problems that arise from inappropriate or unsuitable environment, which adversely affect not only human life but also wildlife, vegetation and aquatic life.

At the beginning of human life, human resources and needs were limited, but as human beings progressed, their needs continued to rise. To fulfil their growing needs, they began to use natural resources rapidly. This careless use of resources not only began to reduce the resources rapidly but their use affected the environment also. As a result, in this age of technology, many environmental problems have arisen. Following are some of the major environmental hazards being faced by Pakistanis:

- | | |
|--------------------|-------------------------------|
| 1. Pollution | 2. Deforestation |
| 3. Desertification | 4. Salinity and water logging |

Details of these environmental hazards are as under:

1. Pollution

In the present age where scientific developments have provided innumerable facilities for human beings, it has also initiated some activities which are causing severe damage to the environment. The most significant of these is environmental pollution. The mixing of contaminants into a natural environment, which is harmful not only for human beings but also for other creatures is called environmental pollution.

There are three types of environmental pollution.

- | | | |
|-------------------|----------------------|----------------------|
| (i) Air Pollution | (ii) Water Pollution | (iii) Land Pollution |
|-------------------|----------------------|----------------------|

(i) Air Pollution

Air pollution refers to an increase in the amount of harmful gases in the air, such as carbon dioxide and sulphur oxide etc. Smoke from the factories and vehicles is resulting in increase in the harmful gases in the air, which is damaging the natural environment, such as the depletion of ozone layer and raising earth temperature (called global warming). In addition, it is a cause of various harmful diseases, such as lungs cancer and various skin diseases etc.



Air Pollution

Human development cannot be interrupted to reduce air pollution, but such measures can definitely be taken which can reduce the emissions of toxic and harmful

gases. For instance the use of such fuels for vehicles that reduce pollution, such as CNG, etc. or growing more trees. Similarly, installing filtration plants in mills and factories. In addition, the use of such gases that are harmful for the environment, such as chlorofluorocarbon, should be banned.

(ii) Water Pollution

Water pollution refers to the mixing of various toxic chemicals in water. Water that is discharged from factories contains a number of harmful chemicals that flow into the rivers, canals and oceans and become part of it. In addition, underground water is contaminated by the use of various pesticides and chemical fertilizers, which are not only dangerous for human life but also damage vegetation and aquatic life. To prevent water contamination, the waste water from the factories should be cleaned with filtration plants and then discharged it into rivers or canals.



Water Pollution

(iii) Land Pollution

Land pollution refers to the spread of toxic material from household waste, factories and hospitals on the surface of land which not only affects the beauty of the earth, but also causes the environment to deteriorate. Land pollution can be tackled through solid waste management techniques such as suppressing poisonous material (or burning under certain temperatures) and reusing the rest of the material by the recycling process. Besides, garbage can be converted



Garbage

Do you know?
Smog is also a type of pollution that is a mixture of smoke and fog. It causes eyes, lung and skin diseases in humans.

into manure.

2. Deforestation

For the development of any country, forests should cover 25% of the total area, but in Pakistan less than 5% of total area is covered with forests. Furthermore, the existing forests are being cut ruthlessly. This situation is not only damaging our economy but also damaging our environment. Forests are the only source of providing oxygen to the planet earth, but uncontrolled deforestation is reducing oxygen production. In addition, there is a substantial increase in the amount of harmful gases in the atmosphere, such as carbon dioxide, which is not only deteriorating the environment but also increasing the temperature of the earth. This is the reason, why climate change is occurring by way of decrease in rainfall or excessive increase in rainfall, floods and changes in period of rainfall, etc., which is adversely affecting our agriculture sector.



Deforestation

The main reason for all this is deforestation. Therefore, we should strive not only to protect the existing trees but also to plant more forests so that we can save our environment from climate change. Deforestation is also damaging wildlife and many of its species are being wiped out by the destruction of their natural habitat.

Do you know?

Reforestation refers to planting of new forests in place of deforestation.

3. Desertification

Human activities, grazing of cattle, cutting of trees from forests and growing the same crop repeatedly in the soil, all together make the land barren, infertile and uncultivable. All this process of defacing the land is called Desertification. Almighty Allah has blessed Pakistan with rich agricultural land but water scarcity is turning this rich land into a desert. Here are some of the main reasons:

1. The use of poor and old methods of cultivation are increasing soil erosion which is turning the land into a desert.



Barren Land

2. Repeated cultivation of the same crop on a piece of land decreases its fertility. After a few years, the land becomes barren and turns into desert.
3. Water is being wasted from the canal irrigation system. The establishment of more industries is also consuming more water, which is causing water shortage to irrigate the land.

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4. Salinity and Water Logging

Pakistan is an agricultural country and most of our agriculture depends on canal irrigation. Undoubtedly our agriculture sector is growing and agricultural production is increasing due to a well developed canal system, but at the same time our agricultural lands are being affected by the canal irrigation system. Underground water level is rising due to canal water. When the water level in an area is up to 5.1 metre, the soil salts come to the surface with water. The water evaporates and the salts remain on the surface of ground. As a result, the land becomes uncultivable and barren. This state of affairs is called water logging.

When the amount of sodium and soluble salts increases in water logged land, this state is called saline. Saline affected land can be recovered through cultivation of grass varieties such as Kullar grass, Bermuda grass, Sudan grass, etc. and fodder such as jantar, berseem, lucerne and millat, etc. to produce good yield from it.

Sometimes the level of underground water gets further elevated and the water passes through the mass of the soil and comes to the surface, thus, the ground becomes swamp. This is called salinity. In some circumstances, the land even becomes barren and

unable to cultivate. Many agricultural lands in Pakistan have lost their productive capacity due to salinity and water logging. These agricultural lands are being made cultivable in the following ways.

1. Kullar grass is being planted in water logged land to make it cultivable.
2. In Pakistan, water channels, rajbahs and canals are being cemented to prevent wastage of water and protect the land from water logging. With the desilting of water channels, others programmes like cementing of the water channels and canals have also been launched. It has multiple benefits. There is less waste of water on the one hand and there is more water available for irrigation on the other.
3. In the areas of salinity and water logging such trees are being planted that absorb more water through the roots and transfer it into the atmosphere. For this purpose, eucalyptus and poplar trees are planted.

Problems associated with the conservation strategies for water, land, natural vegetation and wildlife

The problems associated with the conservation strategies for water, land, natural vegetation and wildlife are described below:

i. Water

Owing to lack of resources and proper arrangements, sewerage treatment plants are not being installed, consequently, river and sea water is getting polluted. One of the reasons for the shortage of irrigation water is the loss of water in the canals. This loss is for want of lining of canals. Resources are needed to construct lined canals. Due to lack of resources, dams are not being built on the rivers, which results in the flow of lot of water into the sea every year. There is an urgent need to build new dams. The old and traditional methods of irrigation are wasting water. For this, farmers must be educated and trained.

ii. Land

It is essential to reduce salinity and water logging, in order to save the land. Tube wells can be installed to do this. In Pakistan, forests are being cut down for developing housing schemes, factories, motorways and highways, due to which cultivable area is reducing. Land can also be conserved by limiting these human activities. Land can also be saved by destroying the heaps of garbage lying at places. Land can also be saved by applying new and innovative cultivation methods. We should not repeatedly cultivate

the same crops on the land so that its fertility is maintained.

iii. Vegetation

Trees are not only an important habitat for animals and birds, but also reduce the effects of floods and storms. Humans have begun cutting them to make housing, fuel and furniture, etc. The existing rules for protection of vegetation need to be revised. The future of vegetation can be secured by the efforts of state and the community. In order to save the vegetation, it is also necessary to start awareness campaigns for the people. We should not cut down the trees unnecessarily. The vegetation should be protected from various diseases. Vegetation can also be protected by controlling environmental pollution.



iv. Wildlife

The most serious problem in protecting wildlife in Pakistan is the illegal hunting which should be forbidden. Pastures are reducing due to herding/grazing. People are not aware of this issue. Public can be educated through awareness programmes. Hunters should be encouraged to seek other sources of income rather than hunting or trading wildlife. Rapidly increasing human population also affects wildlife. Wildlife is facing problems due to shortage of water resources. Wildlife is migrating to other areas due to deforestation, which should also be avoided.

QUESTIONS

1. Four possible options are given for each statement. Mark (✓) on the correct option.

- In Summer Season, the average temperature of plain areas of Pakistan is:

(a) 20 °C	(b) 30 °C
(c) 40 °C	(d) 50 °C
- The total area of Pakistan is:

(a) 670570 Square Kilometre	(b) 796096 Square Kilometre
(c) 755096 Square Kilometre	(d) 79065 Square Kilometre
- K-2 Mountain is located in:

(a) Himalayas	(b) Koh-e-Karakoram
(c) Koh-e-Sufaid	(d) Koh-e-Hindukush
- Out of the total area for the development of any country, the percentage of area for forestation should be:

(a) 15%	(b) 25%
(c) 35%	(d) 45%
- The height of Nanga Parbat is:

(a) 7690 metres	(b) 8126 metres
(c) 8792 metres	(d) 6790 metres
- Karachi is the largest city of Pakistan, it is famous for

(a) agriculture	(b) mining
(c) industry	(d) rearing

2. **Fill in the blanks.**

- Pakistan has _____ in the north.
- Siachen is a word of _____ language which means _____.
- The River _____ is the longest river of Pakistan.
- Forests cover only _____ % of the total area in Pakistan.
- Smog is a mixture of fog and _____.

3. **Write short answers.**

- Define the term "location".
- Name the four natural regions of Pakistan.
- Define water logging and salinity.
- Indicate any two benefits of forests.
- Name any three glaciers located in Pakistan.
- Indicate any two ways of saving water from pollution.
- Define the term "desertification".
- Name the types of canals in Pakistan.
- What kind of climate change is occurring due to rising earth temperatures?
- Write down two disadvantages of deforestation.

4. **Match Column "A" with Column "B" and write correct answer in Column "C".**

Column "A"	Column "B"	Column "C"
China-Pakistan	Koh-e-Hindukush	
Trichmir	Carbon Dioxide, Sulphur	
Air Pollution	Economic Corridor	
Gwadar	Mangla Dam	
River Jhelum	Balochistan	

5. **Give detailed answers.**

- Describe the location of Pakistan and its significance.

- Explain the Physical Features of Pakistan.
- In how many climatic regions is Pakistan divided? Write down the detail of each region and elaborate how climate affects the human life.
- Explain the environmental hazards of water logging and salinity and desertification in the context of Pakistan.
- Describe the solutions of the problems associated with the conservation strategies for water, land, natural vegetation and wild life.
- What is pollution? How does it pollute our environment?
- Discuss the types of forests, their importance and protection.

Activity

- Ask the students to prepare charts on the tips for preventing various types of pollution and display them in the classroom.

Instructions for Teachers

- Familiarise the students with the benefits of textile, electrical equipment, sports equipment, sugar industry, leather industry and cutlery industries etc.