

THE ENVIRONMENT OF PAKISTAN

Paper 2 of Pak. studies (2059/2)

AIMS AND OBJECTIVES

The syllabus aims to give candidates a knowledge and understanding of the importance to the people and country of Pakistan of *its physical characteristics, human and natural resources, economic development, population characteristics, and their inter-relationships.*

Candidates will be assessed for their attainment in each of two objectives, in the following weightings:

- 1 .Ability to demonstrate knowledge of the material specified in the Syllabus Content. 60%
- 2 .Ability to show understanding of the geographical and environmental features and their inter-relationships 40%

SCHEME OF ASSESSMENT AND PAPER FORMAT:

The examination consists of one written paper of 1 hour 30mnts duration.

Five questions will be set.

Candidates must answer any three of the questions.

Each question:

- will consist of two, three, four or five separate parts,
- will carry a total of 25 marks,
- may be based on one or more of the topics of the Syllabus Content,
- may require the ability to interpret diagrams, graphs, maps, photographs, tables and written data.

All answers must be written in English in the given space only.

SYLLABUS CONTENT

1 The Land of Pakistan

A Location of Pakistan – latitude and longitude – the Arabian Sea – countries surrounding Pakistan and its position in South and Central Asia

B Location of provinces and cities – provinces, including the Northern Area and FATA – cities (Islamabad, Karachi, Lahore, Peshawar, Quetta and also Chitral, Faisalabad, Gilgit, Gujranwala, Gwadar, Hyderabad, Mingora, Multan, Rawalpindi, Sialkot, Skardu, Sukkur)

C The natural topography, including drainage – locations and main features of land forms (mountains, plateau, plains, Indus delta, deserts) and major rivers – their influence on the economy and on the lives of the people

D Climate – location of the climatic regions – seasonal and regional variations and the factors contributing to them, including the factors which contribute to monsoon, depression and thunderstorm rainfall, – the influence of climate, including storms and floods (benefits and problems), on the economy and on the lives of the people .

2 Natural Resources

A Water – origins of water supplies – Indus Water Treaty – uses of water (agricultural, industrial and domestic) – problems and solutions

B Forests – types and distribution – products of these primary industry – afforestation – effects of deforestation, including problems and solutions

C Mineral resources – distribution, methods of extraction used in this primary industry (in brief) and uses of coal, natural gas, petroleum, limestone, rock salt and chromite – other metallic and non-metallic mineral resources of Pakistan (in brief).

D Fish – marine and inland fishing, a primary industry – fishing methods, including fish farming – main fish caught according to location – fishing ports – uses

3 Agriculture – Pakistan's Main Primary Industry

A Agricultural systems – small-scale subsistence farming, cash crop farming, livestock farming

B Crops – (i) main areas of production and uses of the main crops – cotton, rice, sugarcane, and wheat

(ii) One important area and use of other crops – apples, apricots, bananas, dates, maize, Mangoes, millet, oilseeds, oranges, pulses, tobacco and vegetables

Livestock – main areas where kept and uses of buffaloes, cattle, goats, sheep and poultry

C Factors affecting production on small-scale subsistence farms, on cash crop farms (cotton, rice, sugarcane and wheat only) and for the keeping of livestock

Natural factors: topography, climate (for both kharif and rabi crops), soils, pests and diseases

Human factors: capital, labour, size of holdings, farming practices, irrigation (types and methods), waterlogging and salinity including solutions, outline of government actions to increase agricultural production.

4 Secondary and Tertiary Industries

A. Raw materials for secondary industries – natural resources, agricultural products and imports

B. Power (energy) resources

- Availability and transport of coal, natural gas and petroleum
- Electricity generation including multi-purpose schemes
- Advantages and disadvantages of the different methods of producing electricity
- The transmission and availability of electricity

C Secondary industries – processing and manufacturing industries – large and small scale, including cottage industries

- Main areas and factors affecting their location and development – products – markets – outline of government actions to encourage industrial growth, including industrial estates and export processing zones

Industries to be studied: cement, cotton (from ginning to clothing), crafts, fertilizers, iron and steel, oil refining, sports goods, sugar refining, surgical instruments

D Tertiary industries – tourist industry: domestic and international visitors (including tourists, visitors on business and those visiting families), natural and cultural attractions, the feasibility of developing tourism, advantages and disadvantages of developing a tourist industry for the people and country of Pakistan

5: Trade

A Major exports and imports – importance of and trends in exports and imports

B Pakistan's trading partners – promotion of overseas trade – problems of maintaining and increasing overseas trade

6 Transport and Communications

A Internal – road and railway networks – regional airports and air routes – factors affecting their locations and development advantages and disadvantages of the different methods of transport for goods and people

B International – roads, railways, ports, dry ports and airports – factors affecting their locations and Development

C Telecommunications – their contribution to educational and industrial developments; the importance of this contribution to the development of Pakistan

7 Population

A Structure and growth – age structure and sex structure, including causes and effects of changes over time – reasons for population growth – problems caused by population growth and solutions

B Movements of population – rural-urban migration, seasonal migration, emigration and immigration – causes and effects of population movements, including solutions to the problems that may result

C Distribution and density of population and the factors affecting these

D Employment – primary, secondary and tertiary occupations – availability of labour – literacy.

GENERAL RECOMMENDATIONS

(a) Inter-relationships of the topics would be there (so don't skip any unit)

(b) The use of the specialist vocabulary required for this subject. Attention must be paid to the definition of terms such as piedmont plain, doab, afforestation, link canal, perennial canal, ginning, railway network, literacy ... etc.

INTRODUCTION TO GEOGRAPHY OF PAKISTAN

The geography of Pakistan is a profound blend of landscapes varying from plains to deserts, forests, hills, and plateaus ranging from the coastal areas of the Arabian Sea in the south to the mountains of the Karakoram Range in the north.

Location of Pakistan:

- Pakistan is located between latitude **24** degree north to **37** degree north.
- Extends from longitude **61** degree east to **78** degree east.
- At the **north east**, Pakistan has a common border with **china**,
- In the **west** it has a long border with Afghanistan, known as **Durand line**.
- To the **North West**, Wakhanis the narrow strip of Afghan territory which separates Pakistan from Tajikistan.
- To the **south west**, Pakistan has a common border with the Islamic republic of **Iran**.
- The **Arabian Sea** marks its **southern** border.
- In the **east** it has a border with **India**.
- There five provinces of Pakistan, namely Punjab, Sindh, KPK, Gilgit Baltistan & Baluchistan.

Physical importance of Pakistan:

- Pakistan stretches from extremely high mountainous areas in the north to the sea in extreme south.
- The northern mountains of Pakistan are so steep that they are called the roof of the world.
- Every type of physical feature like mountains, hills, plateau, glaciers, valleys, deserts, plains, etc. is located there.
- Pakistan has about 1000 km long coastal line of which 750 km is in Baluchistan & 250 km in Sindh.

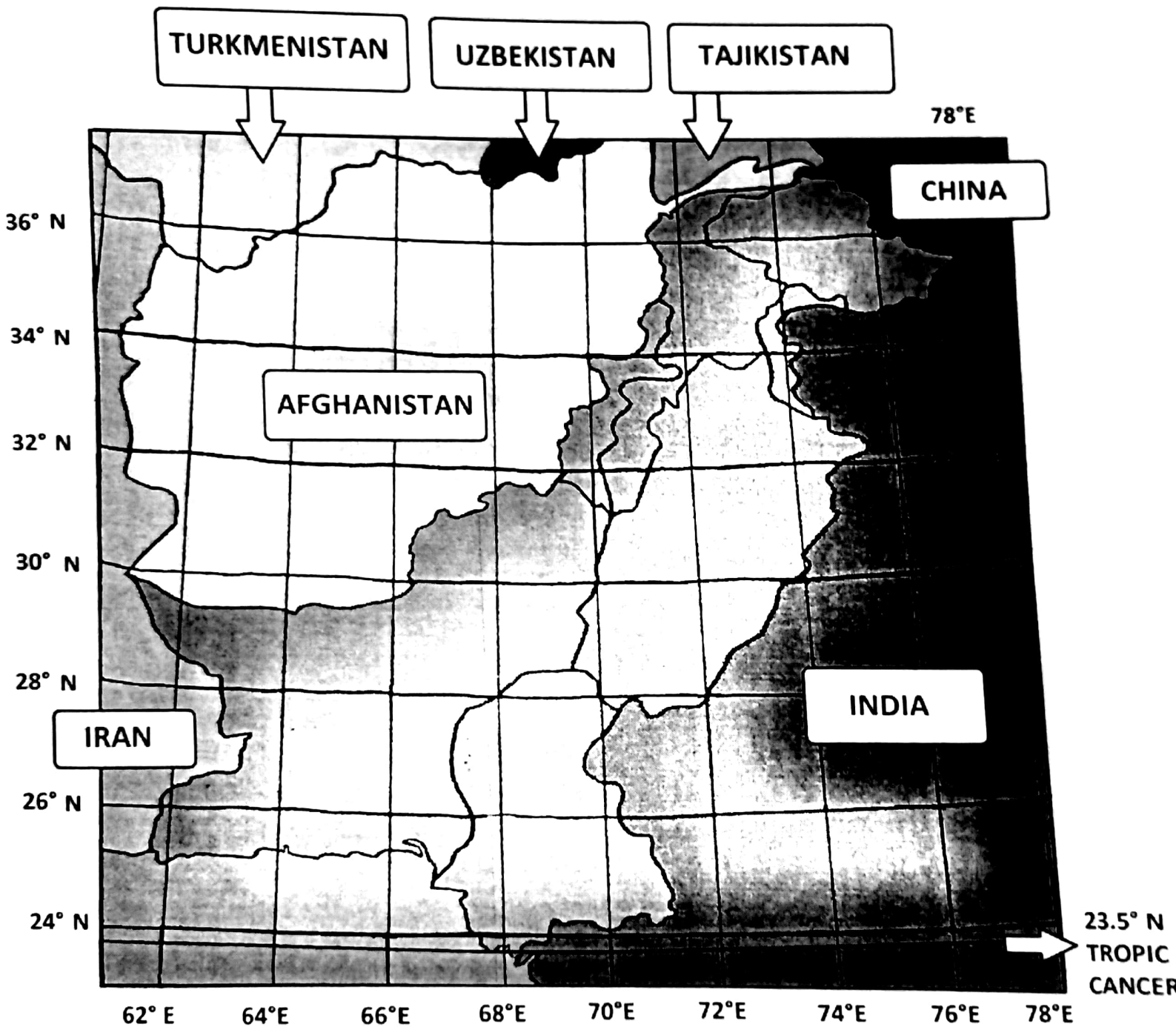
Economic importance of Pakistan:

- *Pakistan is provided with the best agricultural plains giving variety of crops ever year.*
- *Huge mineral reserves are found in Pakistan such as coal, iron ore, magnetite, rock salt etc.*
- *Mountaineers & tourist are attracted to Pakistan.*
- *Pakistan is an important sea & air transit route to go to Europe, Middle East from East Asia & vice versa.*
- *Pakistan sea ports remain open throughout the year so Pakistan can provide sea access to land locked countries like Afghanistan & some central Asian states.*
- *Arabian Sea is in central position for trading by sea both with south Asia & Far East & beyond with the Middle East to the west.*
- *Feasibility of natural gas pipeline project from the CARS countries & Iran to India & south East Asian countries after passing through Pakistan.*
- *These projects could bring enormous economic benefits to Pakistan such as transit revenue, power resources for various industrial, commercial & domestic uses.*

Political importance of Pakistan:

- *Pakistan enjoys a key position in south Asia.*
- *Khyber Pass provides a route to Afghanistan.*
- *Karakoram highway now makes communication with china easier.*
- *China has emerged as an economic and political power in the world today, Pakistan being the immediate neighbor of china has increased good foreign relations with it.*
- *India being a biggest democratic country with a population of one billion is also enhancing the political importance of Pakistan.*
- *Pakistan has become the most focused country of the world due to on-going war against terrorism in Afghanistan.*
- *Most Daring and one of the most oil producing countries of the world Iran is also effecting the political position of Pakistan.*

MAP OF PAKISTAN WITH LONGITUDES, LATITUDES AND NEIGHBOURING COUNTRIES



MAP OF PAKISTAN WITH PROVINCES AND CITIES



Unit 1

PAKISTAN: THE NATURAL TOPOGRAPHY

What the topography means:

Topography is the study and description of the surface features of land. Pakistan can be divided into six major natural topography areas.

- (i) The ***northern mountains*** and north western mountains. (Himalayas, Hindukush, the Karakorum)
- (ii) The ***western mountains*** (Safedkoh ranges, Waziristan hills, Suleiman range, kirthar range)
- (iii) The ***Baluchistan plateau***
- (iv) ***Potwar plateau*** and Salt ranges
- (v) The ***Indus plain***
- (vi) ***Desert areas.*** (Kharan desert, Thar desert, Thal desert).

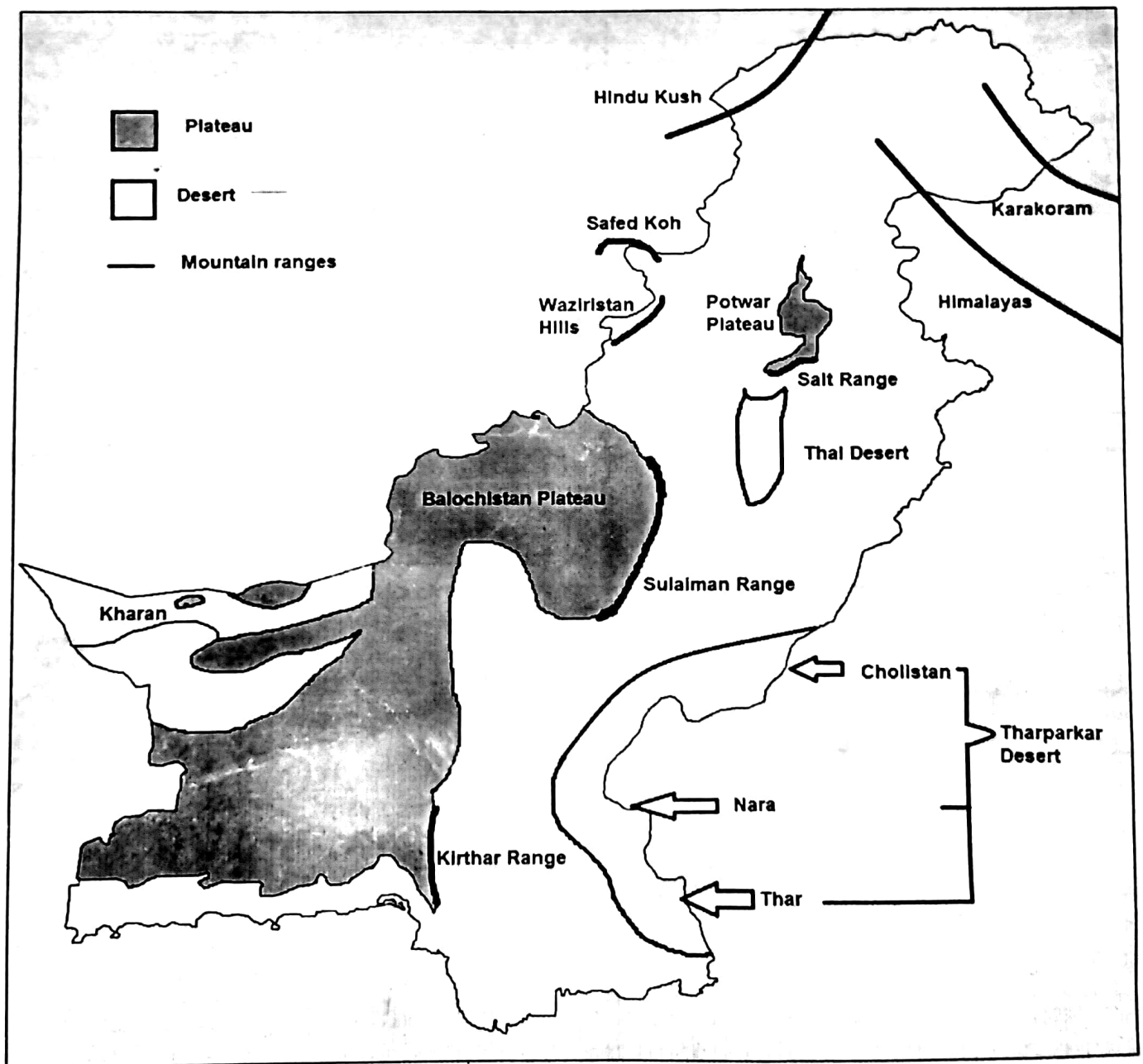


Plate Tectonic Theory:

The word 'Tectonics' comes from the Greek word 'Tekton' meaning builder. The theory suggests that the surface of the earth is made up of rigid plates of lithosphere which floats on the more mobile asthenosphere (35 km below lithosphere). The plates are in constant motion due to the movement in the asthenosphere. This Theory explains many of the major processes such as drifting of continents, mountain building, earthquakes and volcanic activities. Much of this activity occurs at the edges, or margins, of the plates.

KARAKORAM RANGE

Karakoram is situated in the north of Himalaya in which Northern Kashmir and the regions of Gilgit are situated. Its highest top is K-2 which is 8.611 meters high.

Relief:

- Average altitude about 6000 m
- Karakoram means black gravel
- Mass of rock & ice located at the extreme north of Pakistan.
- Extending for more than 400 km from Hunza to Shyok River.
- Range runs in an east to west direction & forms a very rugged landscape.
- Snow covered peaks, valleys, gorges (a narrow valley between hills or mountains, typically with steep rocky walls and a stream running through it), cliff, Ravines and gully (a water-worn ravine) are important features are found there.
- Steep sided peaks and deep narrow valleys are located there.
- Cold winds blow during winters and temperature falls below freezing point in winters.
- Precipitation is mainly in the form of snow fall at higher altitude and rainfall at lower altitude during winter.
- Winters are long and cold while summers are mild and short.
- Alpine forests are located.
- Siachen (78km), Biafo (62.5) Baltoro, Batura and Hispar are famous glaciers here.
- Khunjerab & Karakoram pass are located in the Karakoram Range.



Gorge



Ravine

Drainage of Karakoram Range: (how water is carried from one place to another)

- Drainage is called total run off of water.
- River Shyok and river Gilgit are the main source of drainage.
- As main glaciers are located in the region so the melting of snow gives rise to the water table.
- As the rivers are in the upper course so the flow of rivers is very fast.
- Whatever comes in the flow of the rivers like pebbles stones etc. are carried forward and is deposited in the reservoirs in the form of silt.
- Due to the deposition of silt the storage capacity of reservoirs is decreasing.

HIMALAYAN RANGE:

Himalaya is surrounded by most of the part of Pakistan towards North. Himalaya means "the house of ice". These mountains are spread up to Gilgit. The name of one of its top mountain is Nanga Parbat.

Relief

- Located at the South of Karakoram Range.
 - Runs in east to west direction.
 - Himalayan range comprises of
- (i) Siwaliks (600-1200 meters) these hills are located near Attock.

(ii) Lesser or lower Himalayas (1800 -4500meters) are represented by Pir Panjal Range and consists of Murree, Nathia gali, Gora gali etc.

(iii) Central Himalayas or great Himalayas (5000-8126 meters) are located between Pir Panjal Range and Karaoram range. Nanga Parbat (8126 meters the highest peak of this range) and Rakhiot (7074 meters) are located there.

- Snow covered mountains are found here.
- Steep sided mountains & deep narrow valleys are located here.
- Extreme cold winds blow during winters.
- Winters are cold & long while summers are mild & short.
- Snowfall at higher altitude & rainfall at lower altitude is experienced during summers.
- Alpine & coniferous forests are found here.

Drainage:

- River Indus & River Chenab is the main sources of drainage.
- Melting of snow gives rise to the water table.*
- As the rivers are in the upper course, so the flow of the river is very fast.
- Whatever comes in the flow of the river is carried forward & deposited in reservoirs in the form of silt.
- Due to the deposition of silt, the storage capacity of the reservoirs is decreasing.

* A.K.A Groundwater table, upper level of an underground surface in which the soil or rocks are permanently saturated with water.

HINDUKUSH RANGE

The Hindukush range lies in the North West of Karakoram Range. Most of the mountains of this range are in Afghanistan. The highest top of this range is Tirichimir which is 7690 meters high. In this range Chitral and Dir are situated.

Relief:

- The Persian-Indian dictionary indicates it's meaning to be "kills the Hindus" or "Hindu Killer".
A remainder of the days of when slaves from India died in the harsh weather.
- Hindu Kush lies where the borders of Afghanistan & China meet on Pakistan's north & North West border.
- Located to the South West of Karakoram range.
- Average height of mountains is 5000 meters.
- Runs in North of South Direction.
- Tirich Mir (7690 meters) & Noshag (7484 meters) is the highest peak.
- Snow covered peaks are found here.
- Steep sided mountain & deep narrow valleys are located here.
- Many passes including Khyber Pass, Lawari Pass, Shandur Pass etc. are located there.
- Winters are cold & long while summers are mild to hot & short.
- Extreme cold winds blow during winters.
- Temperature falls below freezing point.
- Snowfall at higher altitude & rainfall at lower altitude is experienced during winters.
- Alpine & coniferous forests are found here.

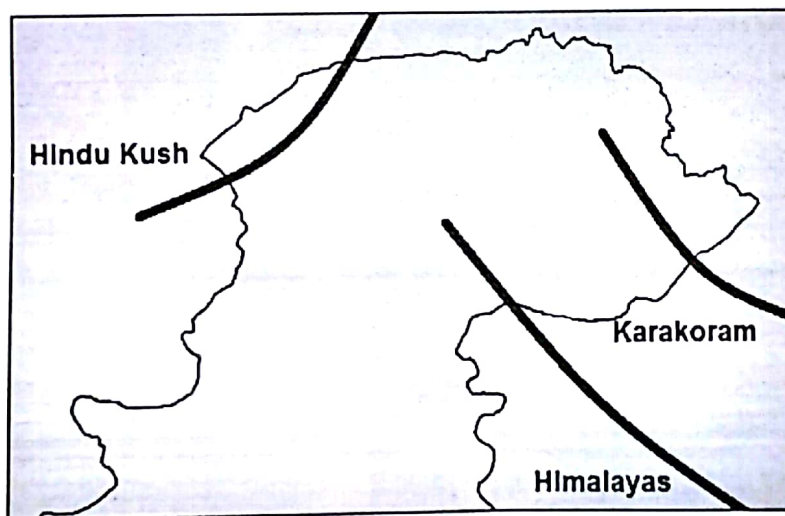
Drainage:

- **River Swat & river Kabul** are the main sources of drainage.
- **Warsak Dam** on river Kabul is the main source of irrigation, drainage and power of generation.
- Melting of **snow** gives rise to the water table of the rivers.
- As the rivers are in the upper course, so the flow of the rivers is very fast.
- Whatever that comes in the flow of the river like stone pebbles etc. are carried forward & deposited in the reservoirs in the form of silt.
- Due to the deposition of silt, the storage capacity of the reservoir is decreasing.

Lifestyle & Economic Activities :

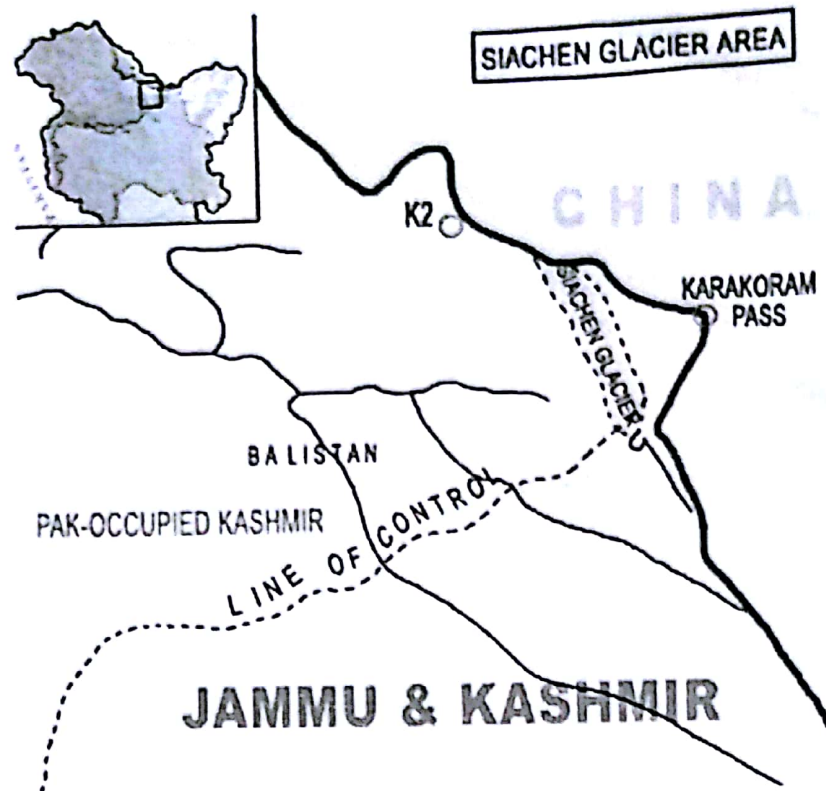
- **Nomadic** to semi nomadic lifestyle is common at higher altitude areas.
- **Animal rearing** is the main profession of the nomadic & semi nomadic people.
- **Transhumance** is practiced at higher altitude areas.
- **Agriculture** is also practiced on smaller scale.
- Warsak dam on river Kabul provides irrigation, drainage & power generation.
- **Mining** is also one of the professions (on Hindu Kush).
- Primary, secondary & tertiary industries are found here.
- Tobacco, wheat, rice & sugarcane are grown here.
- Apple, apricot, grapes, and peaches are common here.

* **Nomadic way of life:**
Nomads have no settled home. They move from one place to another in search of food or making a living.
* **Transhumance way of life:**
Movement of livestock in search of food and water. It differs from nomadism that herders move their families behind.



GLACIERS:

- **Glaciers are a mass of snow on the mountains.**
- Many of the world's glaciers lie in the mountains of Pakistan.
- Some of the important glaciers are
 - (i) Baltoro, 58 km long, in the Karakoram Range.
 - (ii) Batura, 58 km long in the Hunza valley in the Karakoram range.
 - (iii) Siachen, 78 km long, located in the Karakoram Range.



IMPORTANCE OF THE NORTHERN MOUNTAINS:

- Historical passes connect Pakistan to China and Afghanistan. A land route through Karakoram Highway has been opened to carry out trade.
- Snowcapped peaks melt during summer to drain water into river Indus and its tributaries which irrigate vast Indus plain.
- A source of valuable minerals, timber and fruits. Provides raw material to several industries e.g. Furniture, paper, chipboard industry, chemical industries.
- Mountain peaks provide protection to Pakistan against the cold winds from central Asia. The temperature does not go below freezing point over the upper Indus plain & climate remains tolerable throughout the year.
- Scenic beauty promotes tourist resorts which are source of income to local people during summer.

Important Passes of Northern Mountains:

Karakorum 5575 Connects Kashmir with China
 Khunjab 4733 Connects N.Areas with China
 Lawari 3188 Connects Dir and Chitral
 Babusar (Himalayas) 4173 Connects N.Areas and Mansehra

WESTERN MOUNTAINS:

SAFED KOH:

Relief:

- Located at the south of Kabul river

- They are called **safed koh** (White Mountains) because their peaks are often covered with **snow**.
- **Steep sided mountains & deep narrow valley** are located here.
- Height reaches up to 4712 meters.
- **Snowfall** at higher altitude & rainfall at lower altitude is experienced during winters.
- Winters are cold and long while summers are mild, hot & short.
- **Passes** like Kurram pass is found there which provides a route to Afghanistan.
- Cities like Peshawar, Kohat are located there.
- Alpine & coniferous **forests** are located here.

Drainage:

- **River Kabul & river kurram** drain these areas.
- Warsak dam on river Kabul & **kurram dam** on river kurram are the main source of drainage, irrigation and power generation.
- **Melting of snow** gives rises to the water table.
- As these rivers are in the upper course so flow of the rivers is very fast.

WAZIRISTAN HILLS:

Location:

- Waziristan hills are located ***between River Kurram & River Gomal***.
- They reach up to a height of 3513 meters.
- These hill ranges form a rampart between Afghanistan & Pakistan.
- **Passes** like Tochi & Gomal pass located there.
- **Snowfall** at height altitude is experienced.
- Winters are long & cold while summers are mild to hot & short.
- Coniferous **forests** are found here.
- Dera Ismail Khan & Bannu Valley are the famous towns. (important military center)
- These hills are highly mineralized.

Drainage:

- **River Kurram & River Gomal** drain this range.
- **Kurram Dam** on river Kurram provides irrigation, drainage & power generation.
- Melting of **snow** gives rise to the water table.
- As the rivers are in the upper course so the flow of the rivers is very fast.

SULAIMAN & KIRTHAR RANGE:

Location:

- Sulaiman Range is ***located to the west of river Indus***.
- Takht-e-sulaiman at 3500 meters is the highest peak.
- Moving southward of Sulaiman Range is joined by Kirthar Range, which is later backed by the Pab range.

- Lime stone and sandstone are the main minerals in this area.

Drainage:

- Rivers Hub, Porali & Hingoli drain these rivers.
- Braided river channels drain the Suleiman range.
- Hub dam on river Hub provide irrigation, drainage & power generation.

Life style & Economic Activities (western mountains):

- The WM are mostly bare of vegetation and climate & relief do not support farming.
- Canal irrigation is not impossible.
- Transportation is very limited. Except Peshawar and Kohat rest of the area is not connected with air or rail.
- The cost of infrastructure is very high.
- Nomadic to semi nomadic lifestyle is common at higher altitude areas.
- Animal rearing is the main profession of the nomadic & semi nomadic people.
- Western mountains are rich in mineral resources like Natural Gas, Coal, Iron ore, Copper etc.
- In the winters in house cottage industry of carpet making & hand knotted articles become very common.

- 1: Khyber Pass: leads to the fertile vale of Peshawar.
- 2: Kurram pass: a route to Afghanistan
- 3: Tochi pass: connects Gazhni to Bannu.
- 4: Gomal Pass: connects Afghanistan to Derajats
- 5: Bolan: connects the Kachhi Sbi Plain to Quetta.

THE BALUCHISTAN PLATEAU:

- BP is located in the southwest of Pakistan with altitude from 600-3010.
- Total area is 347190 sq. KM.
- It has the following natural topographical features.

a) Basin of northern Baluchistan:

- BP has a number of irregular depressions such as Zhob & Loralai basins situated between Toba Kakar Ranges & the Sulaiman Ranges.
- South west of the Loralai Basin is the Quetta valley.
- Rain is infrequent over here.
- The deposition of material brought by the river channels form alluvial fans on the piedmont plains.

b) Basins of western Baluchistan:

- There are a number of basins between the mountain ranges such as the Chagai hills, Ras Koh, Siahan & central Makran.
- Area is devoid of vegetation & little rainfall.
- These basins have no outlet the sea. So rainfall makes temporary rivers & streams which often soak into the ground.
- These basins are known as inland drainage basins.
- The temporary lakes are called Hamuns in the local language.
- There are Salt Lakes & when the water evaporated, a salty crust is left behind and it is then called Salt Pan.
- The largest of these temporary lakes is called the Hamun-i-mashkel located at the western part of Kharan desert.

c) Mountain ranges:

- Baluchistan Plateau is covered with a number of barren mountain ranges with an altitude of 600-3010 meters.
- These ranges are highly mineralized especially the Chagai Hills including Copper, Gold & sulphur.
- Some of the important hills of Balochistan Plateau are:

Toba Kakar Range
Central Barahvi Range
Chaghai range
Ras koh range
Makran range
Siahen range

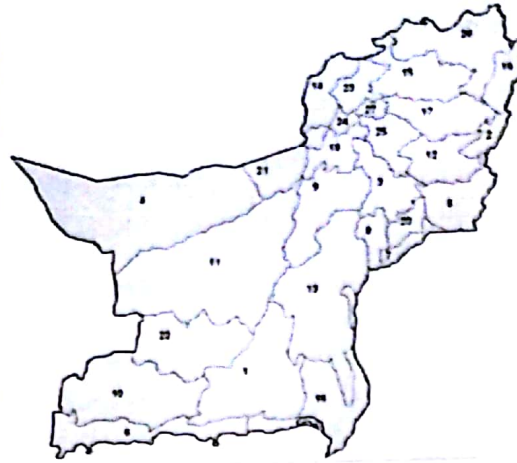
d) The Coastal areas:

- The coastal areas of the Baluchistan Plateau can be divided into eastern and western parts.
- The eastern part comprises the Lasbela Plain and the western part is known as the Makran coast.
- The important rivers are the Hab, Porali, Hingol & Dasht which flow into the Arabian Sea.

Lifestyle & Economic activity:

- Nomadic to semi nomadic lifestyle is common at higher altitude.
- Animal rearing is the main profession of nomadic & semi nomadic people.
- Agriculture is performed.
- Irrigation is obtained through the canals linked with dams & Barrages.
- Fruit orchards grow apple, apricot, peach etc. in large quantities.
- Baluchistan plateau is a mineralized zone & natural gas, coal, limestone, copper etc. are extracted.
- People living on coastal areas perform fishing & marine fishing is the main profession.
- Mangrove forest is the main vegetation of the coastal areas of Baluchistan Plateau.

1. Awaran
2. Barkhan
3. Bolan
4. Chagai
5. Dera Bugti
6. Gwadar
7. Jafarabad
8. Jhal Magsi
9. Kalat
10. Kech
11. Kohistan
12. Kohlu
13. Khuzdar
14. Qilla Abdullah



15. Qilla Saifullah
16. Lasbela
17. Loralai
18. Mastung
19. Musakhel
20. Naseerabad
21. Nushki
22. Panjgur
23. Pishin
24. Quetta
25. Sibi
26. Zhab
27. Ziarat

POTWAR PLATEAU & SALT RANGE:

Location, Relief & Drainage:

- PP and the salt range are located to the south of Islamabad between the river Indus and river Jhelum
- Height of PP varies from 300 to 600 meters.
- It is generally referred to as bad land topography.
- It is dominated by limestone ridges, salt, coal & oil mines & ravines.
- Kalar- Kahar Lake & Khabaki Lake is two salt lakes.
- Kala- Chitta & Khairi – Murat Range are the two prominent hill ranges (1000 meters).
- River Jhelum & River Soan is the two main sources of drainage.
- Manqla Dam on River Jhelum is the main source of irrigation, drainage, & power generation.

Lifestyle & Economic Activity:

- Potwar Plateau is a mineralized zone & minerals like coal, rock salt & Limestone are found in abundance.
- Agriculture is practiced on very small scale.
- Attock Oil refinery is also located here.
- It has a high population density & contains all three types of industries.
- Rawalpindi, Jhelum & Chakwal are the important towns of Plateau.
- It is a very developed place.
- It is linked throughout the country via roads, rail & airways.

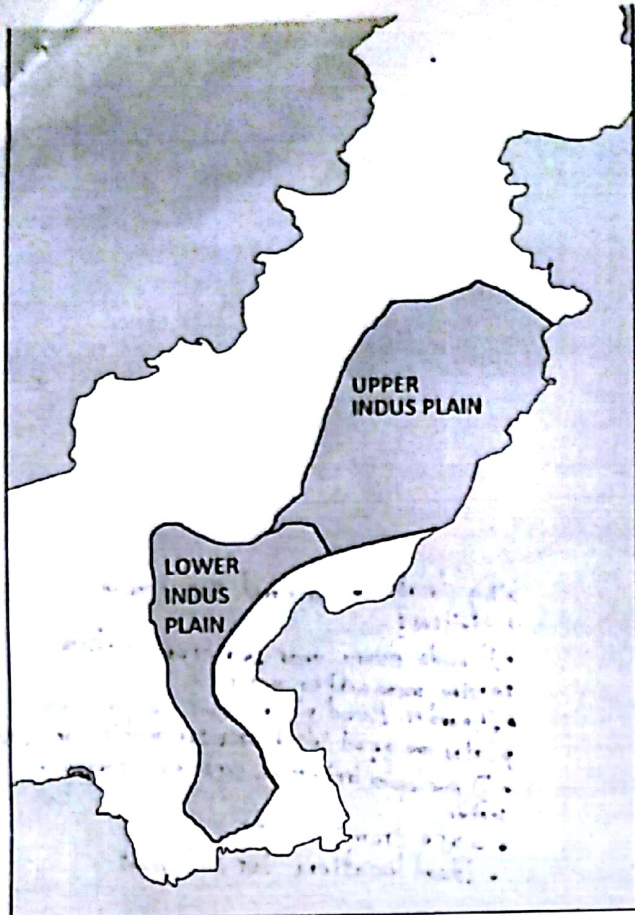
Between two capitals
Lahore and Islamabad

THE INDUS PLAIN:

- The plains that are formed by River Indus & its tributaries.
- Indus plain located throughout most of Punjab & the central part of Sindh.
- Northern part is known as the upper Indus plain.
- Five main tributaries of the Indus joined at Panjnad.
- River Panjnad flows 72 km before joining the Indus near Mithankot.

Economic activities

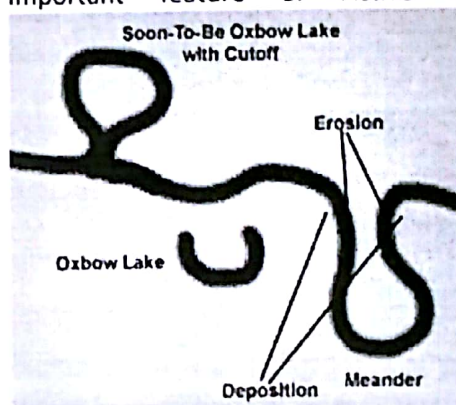
- Most productive region
- Crops are grown e.g. cotton, rice and sugarcane
- Canals irrigation system
- Infrastructure facilities
- Extensive transport system
- Electricity is provided



- Below Mithankot in Sindh, the Indus flow as a gigantic river till it falls into the Arabian Sea.
- This part is known as **lower Indus plain**.

1: Active Flood Plain areas:

- **Narrow strip of land on both sides of the River Indus & its tributaries.** These plains are actively inundated.
- It is locally called as Bet or Khaddar land.
- These plains have fertile top soil formed by the annual deposition of fresh alluvium.
- These plains are annually inundated.
- Flood plain is around 40 km wide which makes it an important farming area.
- The top fertile soil is carried to infertile areas to make them fertile.
- **Meanders, oxbow lakes & levees** are the important feature of Active flood plain.

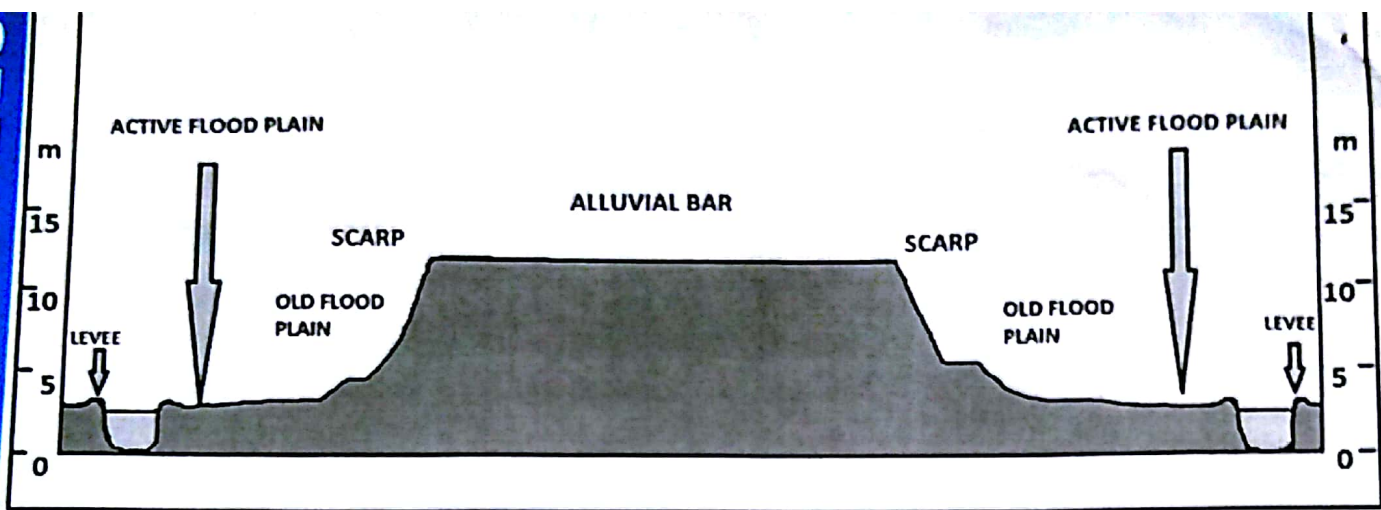


2: The old flood plain areas:

- These plains are formed by the deposition of old alluvium.
- These plains are higher in height than the active flood plains & are inundated once a decade or in heavy monsoon.
- These are among the most fertile plains in the world.
- Meanders scars, oxbow lakes, old levees are also found there. Large quantities of crops are grown there.

3: Alluvial Terraces:

- They are locally **called Bars**.
- Bars are **found in the Doab**.
- **Doab is the land between two rivers.**
- Doabs are favored as areas for a number of human activities such as farming, construction of settlements, buildings of transport and other industrial and business activities.
- There is a high population density in doab areas of Pakistan.
- Bars are 15 to 20 meters high.

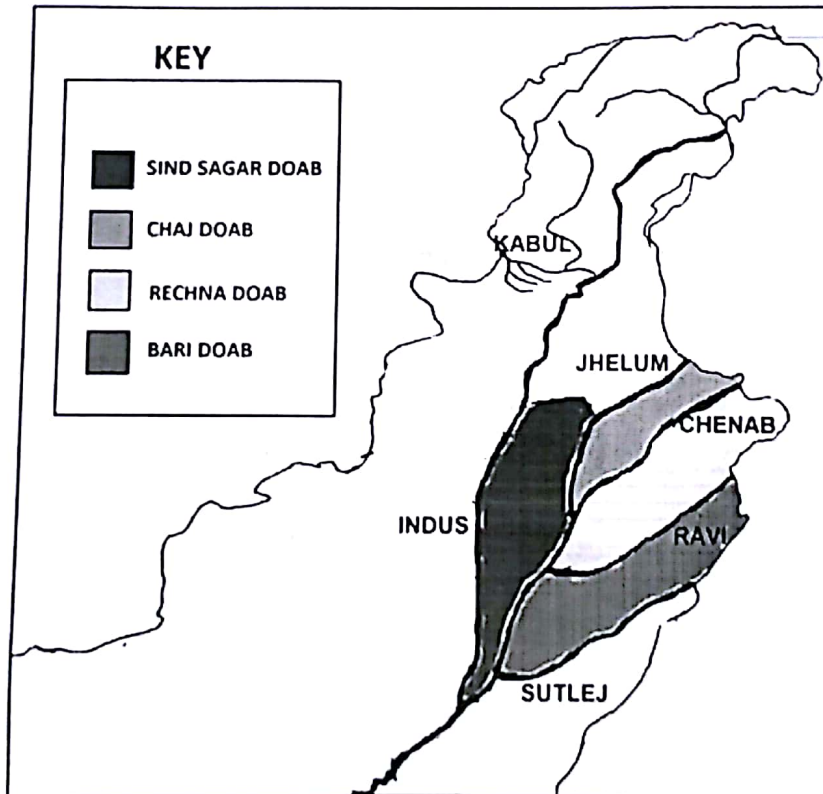


- They are considered ideal for agriculture with the help of irrigation facilities.

- Sindh-Sagar Doab between River Indus & River Jhelum.
- Chaj Doab between River Jhelum & River Chenab.
- Rachna Doab between River Ravi & River Chenab.
- Bari Doab between River Ravi & River Beas.
- Kirana Bar between Sind Sagar Doab.
- Sandal Bar between Chaj doab
- Neeli bar between Bari doab
- Ganji Bar between Bari doab

Why doabs are favored for human activities?

- Floods every year for crops which require more water e.g. rice
- flatter flood plains and lower flood plains are good locations for arable farming
- Developed irrigation system: supply of water
- Safe from flooding
- Ideal locations for settlements



4: Piedmont

- PP is the foot Suleiman,
- The most features are the *alluvial fans*.
- They become active only during the rainy season.
- The gravel, sand and alluvium deposited by rivers form alluvial fans.
- The Suleiman PP is also known as Derajat.
- The pp is mainly agricultural.

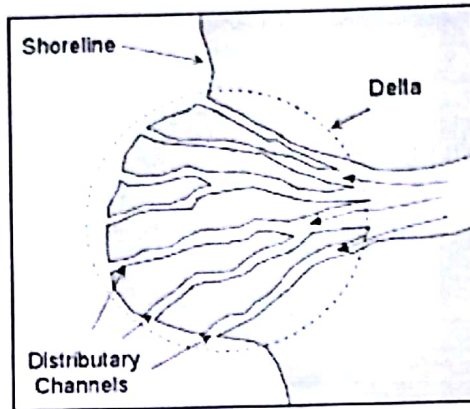
plains:

located at hills of the kirthar and Himalayan mountains. dominant of the pp

5: Tidal delta:

- The Indus delta is located to the **south of Thatta**.
- A delta is often triangular or fan shaped.
- When river flows into sea, its speed is soon checked and its load of alluvium is dropped on the sea floor.
- The Indus delta has mangrove swamps.
- The coastal area is generally low and flat.

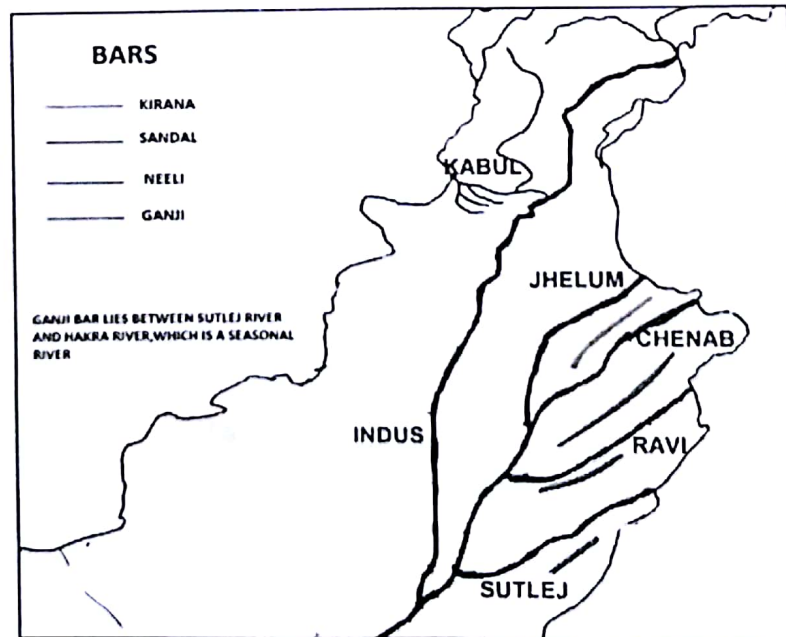
Why Deltas have low population
 • Exposed to effects of sea water e.g. tides
 • Agriculture is limited to few areas due to swampy land
 • Underdeveloped infrastructure
 • Un-mettled roads not suitable for transport vehicles
 • Typical cyclones



6: Cuestas: (a ridge with a gentle slope (dip) on one side and a steep slope (scarp) on the other)

- Cuestas are **the limestone ridges** (mound).
- These ridges are the small variable height features.
- Rohri Cuesta attains the height of about 80 meters & is about 40 km long.
- These limestone ridges provide a firm foundation for the construction of barrages for irrigation.
- Cuestas also provide scenic beauty and flat landscape.

Upper Indus Plain
 • Northern part
 • River Indus flows with its tributaries
 • Jhelum River and Soan River have joined the Chenab at Panjnad to form Panjnad which joins at Mithankot
 • Flat, undulating plain sloping towards south-west
 • Average width of Indus is 1.4 km till Kalabagh and 1.6 km near Sukkur
 • River Indus is in its middle course in the north and enters its lower course towards the south
 • Erosion and deposition take place; deposition southwards
 • Meanders, oxbow lakes, braided channels and trees in dead areas
 • Alluvial terraces or bars are formed
 • Ideal for agriculture with irrigation



Lower Indus Plain
 • Southern part
 • River Indus flows alone
 • River Indus flows into the Arabian sea south of Thatta through its distributaries which flow across its delta
 • Flat, undulating plain sloping towards the south
 • Width is 1.6 km
 • River Indus is in its lower course
 • Deposition is the main function
 • Meanders, oxbow lakes, braided channels and trees
 • Alluvial terraces or bars are non-existent
 • Piedmont plains with alluvial fans to the north
 • Ideal for agriculture with irrigation

The desert areas:

- Desert areas in Pakistan are located at three places.

(i) the Sindh Sagar Doab or **Thal desert**, located between the river Indus and river Jhelum
 (ii) The Thar Desert is located towards south eastern Pakistan. It can further be divided into three main regions:

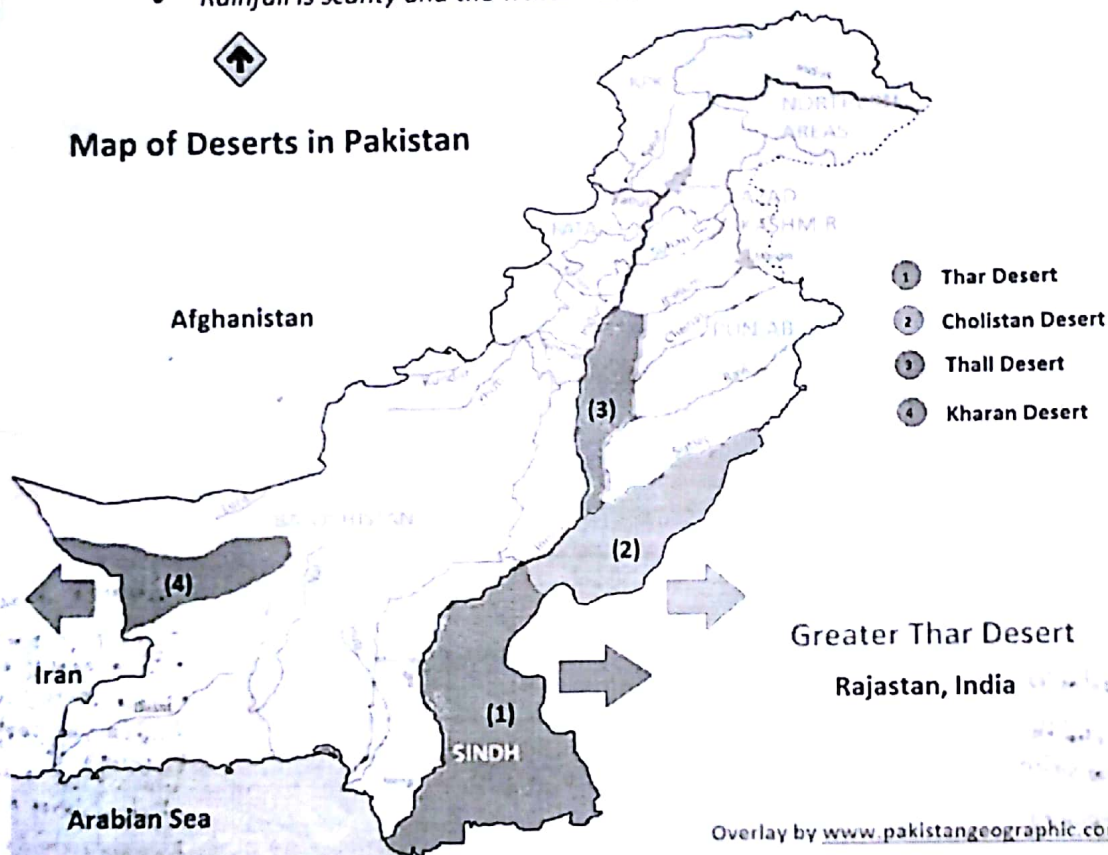
- Cholisthan
- Nara
- Tharparkar (thar)

(iii) The Kharan desert.

- Rolling sand dunes, weathering of rocks, lack of vegetation and bare rocks are the main features in the desert areas of Pakistan.*
- Rainfall is scanty and the water table is extremely low.*



Map of Deserts in Pakistan



Overlay by www.pakistangeographic.com

IMPORTANT TERMS - **Avalanche:** A huge mass of snow that moves down the slope. **Bar:** Alluvial terrace an old flood plain fairly high to active flood plain. **Bet:** Active flood plain. **Doab / Interfluves:** Land between two rivers. **Dhand:** Small salt lake. **Khaddar:** Fresh Alluvium. **Karez:** Irrigation Method used in Baluchistan which consists of a water- tunnel or a narrow underground canal. **Landslide:** landslide is the movement of rocks and soil down the mountain slopes. **Mountain:** A raised part of the earth with a peak, steep slope attaining over 1000 meters height than a hill. **Range:** A group of mountains is called a range. **Plateau:** An area of fairly level high ground. **Plain:** A flat land with fertile soils used to grow crops. **Topography:** The arrangement of the natural and artificial features of an area. The synonyms of topography are land forms/ physical features/ physiography and configuration of earth surface. **Relief:** The specific forms of a physical feature. **Economic activities:** All activities which are carried out to produce something.

UNIT 3

DEVELOPMENT OF WATER RESOURCES:

The **Indus** provides the key water resources for the economy of Pakistan. The River also supports many heavy industries and provides the main supply of potable water in Pakistan.

The ultimate source of the Indus is in **Tibet**. The Indus then flows northwest through Ladakh and Baltistan into Gilgit, just south of the Karakoram Range. The **Shyok River** and **Gilgit streams** carry glacial waters into the main river. It gradually bends to the south, coming out of the hills between Peshawar and Rawalpindi. It flows swiftly across Hazara, and is dammed at the **Tarbela Reservoir**. The **Kabul River** joins it near **Attock**. The remainder of its route to the sea is in plains of the Punjab and Sindh, and the river becomes slow-flowing and highly braided. It is joined by **Panjinad River** at **Mithankot**. Passing by Jamshoro, it ends in a large **delta** to the east of **Thatta**.

We have world's largest and unified irrigation system that consists of three major reservoirs (Chashma, Mangla, and Tarbela); 19 **barrages** (Ferozepur, Sulemanki, Islam, Balloki, Marala, Trimmu, Panjinad, Kalabagh, Sukkur, Kotri, Taunsa, Guddu, Chashma, Mailsi, Balloki, Sidhnai, Rasul, Qadirabad, and Marala); 12 link canals; 45 irrigation canals.

Key Points:

Natural resources:

The means to fulfill our needs

- Land, water, air
- Natural resources can be described as renewable or nonrenewable resources.

(a) Renewable resources:

- RS can be recycled or reused.
- They can be used over and over again e.g. water, sunlight, wind power, tidal power, and geothermal power.
- Sustainable e.g. vegetation, soil, landscape.

(b) Non renewable resources:

- NRS occur in limited quantity
- If their use continues they will run out like fossil fuels and minerals.

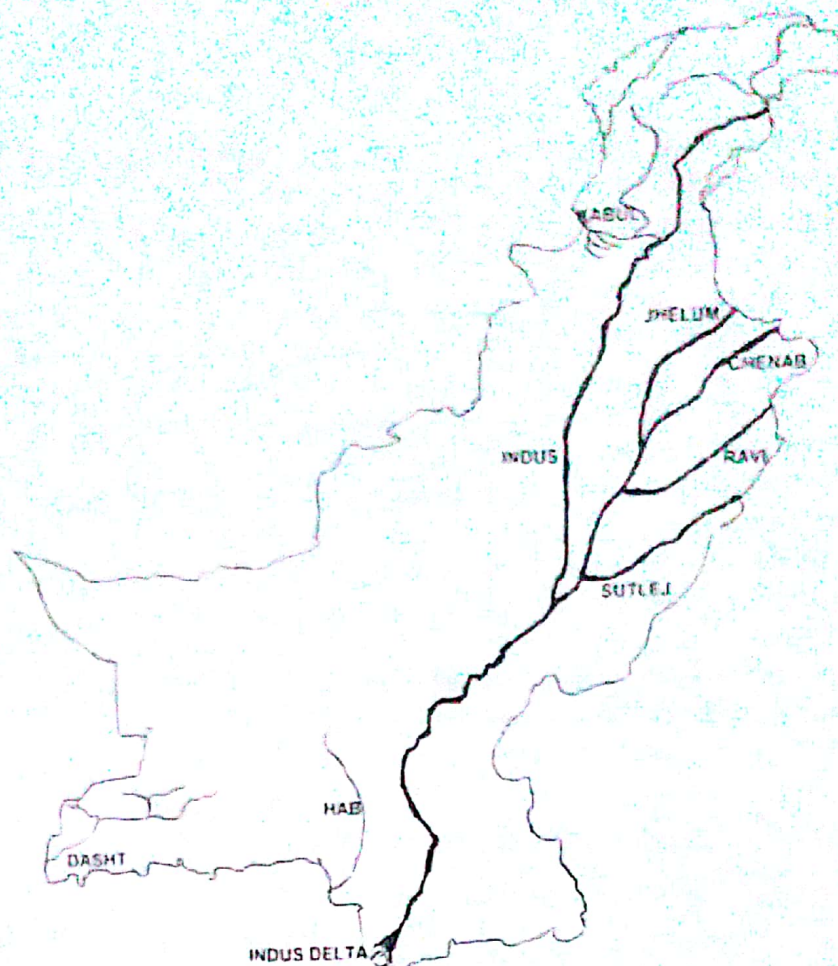
Hydrological cycle:

- The water that reaches the ground from the atmosphere falls in various ways such as rain, snow or hail. This is called **precipitation**.

- Some of the water runs directly off the earth's surface as rivers and streams draining into lakes and the sea.
- The rest of the water is either utilized by plants or soaks into the ground.
- Water is returned to the atmosphere as water vapor through evaporation from surface water and by transpiration from plants.
- Rising into the atmosphere the water vapor cools to form water droplets and this system is called **condensation**.
- This cycle is called the hydrological cycle.

The Indus system:

- Indus is the largest river of Pakistan
- It is watered by the glaciers of the Karakorum and Hindu Kush.
- After crossing the Himalayas it turns into south west and enters Pakistan.
- After leaving the mountainous region of kalabagh the river enters the plains of Punjab and Sindh.
- Finally the Indus flows into Arabian Sea.
- The Indus basin covers an area of about one million square kilometers.
- The system irrigates about 60 % of Pakistan's cultivatable land.
- The source of river Indus is at the lake **Mansorowar** at Tibet China.
- The river Indus forms a **delta** at its mouth.
- The total journey of the Indus from source to mouth is about 2900 km.
- On its way from source to mouth Indus is joined by some Eastern and Western tributaries.
- Eastern tributaries are *Jhelum, Chenab, Ravi, Beas and Sutlej*.
- Rising in the Himalayas and passing through Kashmir, the rivers enter the plains.
- The river Beas joins river Sutlej before entering into Pakistan.
- All the Eastern tributaries join at **Panjnad** and then flow for about a unified stream and join the Indus at **Mithankot** after a distance of 72 km.
- The river Indus has the highest mean monthly discharge in June and July.
- The western rivers are Swat, Kabul, kurram, Tochi, Gomai, Zhob.
- These are smaller in length and width and have less water than the eastern tributaries.



Baluchistan River System:

- Quetta being a high altitude region has the central position in the drainage pattern of Baluchistan.
- Rivers like *Zhob, Khandar and the kalachi drain into river Indus* because they flow eastwards.
- The rivers *Loralai, Chakar, Bolan and Mula are absorbed into Kachi Sibi Plain.*
- The rivers *Hab, Porali, Hingol and Mashkel drain into the Arabian Sea*
- There are many small rivers that flow westward and drain into shallow depressions called Humuns.
- There are so many rivers in Baluchistan those are absorbed in the land and do not join any other water body.
- This unique pattern of drainage is called Inland Drainage. Braided river channels are the depressions those are flooded only when there is heavy rainfall and otherwise they remain dry

Indus Waters Treaty

- The **Indus Waters Treaty** is a water-distribution treaty between India and Pakistan, brokered by the World Bank (then the International Bank for Reconstruction and Development). The treaty was signed in Karachi on September 19, 1960 by Prime Minister of India Jawaharlal Nehru and President of Pakistan Ayub Khan.
- According to this agreement, control over the three "eastern" rivers — the Beas, the Ravi and the Sutlej — was given to India, while control over the three "western" rivers — the Indus, the Chenab and the Jhelum — to Pakistan.

- Tarbela Dam is an earth fill dam located on the Indus River in Pakistan. It is the largest earth-filled dam in the world and fifth-largest by structural volume.
- The Mangla Dam is a multipurpose dam located on the Jhelum River in the Mirpur District of Azad Kashmir, Pakistan. It is the 7th largest dam in the world.
- Warsak Dam is a mass concrete gravity dam located on the Kabul River approximately 20 km northwest of the city of Peshawar in Khyber Pakhtunkhwa province of Pakistan.
- The Kalabagh Dam is a proposed hydroelectric dam on the Indus River at Kalabagh in the Mianwali District of Punjab Province in Pakistan. Intensely debated, if constructed the dam would have 3,600 megawatts of electricity generation capacity.
- Diamer-Bhasha Dam is a gravity dam, in the preliminary stages of construction, on the River Indus in Gilgit-Baltistan, Pakistan.
- Khanpur Dam is a dam located on the Haro River near Potowar Plateau and the village of Khanpur, Khyber Pakhtunkhwa, Pakistan, about 25 miles from Islamabad, Pakistan. And 15 km from Haripur.
- Baglihar Dam, also known as Baglihar Hydroelectric Power Project, is a run-of-the-river power project on the Chenab River in the southern Doda district of the Indian state of Jammu and Kashmir.

Dam



• Built to generate electricity

Barrages



• Built



Ground Water:

- The water available under the ground is called ground water.

- This water is brought to the ground by the method of lift irrigation by shallow wells, tube wells and the Karez system
- GW can be sweet or saline. But it cannot be saline near the sources or recharge.

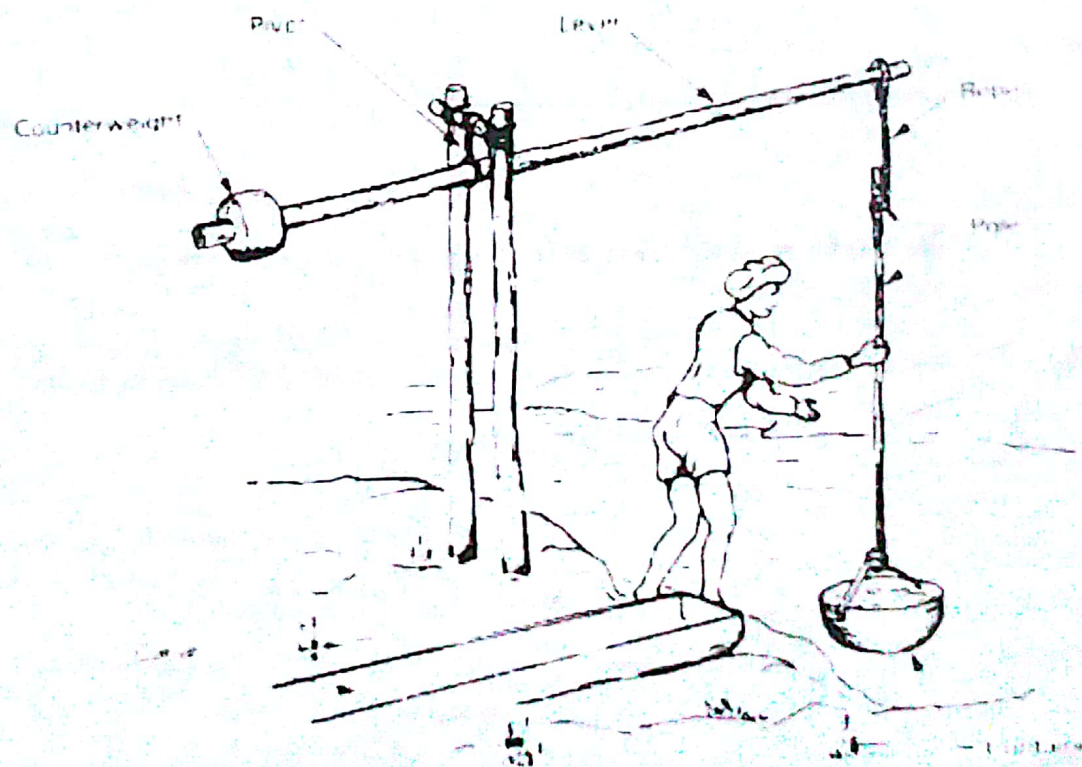
Methods of irrigation:

Traditional Methods:

Damage
- Bricks
- But Bayan
- Cost effective
- Not with
Don't dig from
below

(i) Shaduf:

A large pole balanced on a crossbeam, a rope and bucket on one end and a heavy counter weight at the other. By pulling the rope it lowered the bucket into a canal or river. The operator would then raise the full bucket of water by pushing down on the counter weight.



(ii) Charsa:

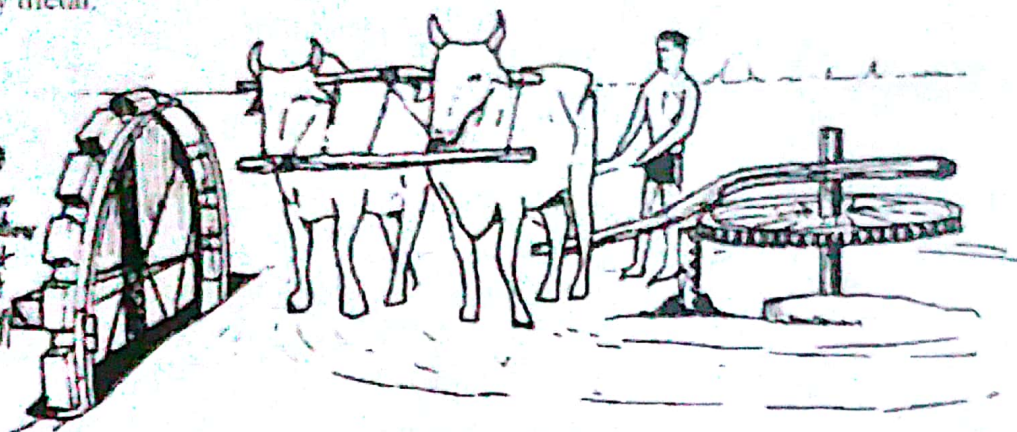
In charsa irrigation, animal power is used to pull out water from the well. In this the small area irrigates and lots of time is waste in this system of irrigation.

- (iii) Well: A well is a hole dug in the ground to obtain the subsoil water. An ordinary well is about 3-5 meters deep but deeper wells up-to 15 meters is also dug.

(iv) Persian Wheel:

Persian water wheel is a device used to raise water out of well or river. It is a system of a chain of buckets slung round a vertical wheel, which is turned by a system of another interlocking vertical and horizontal wheels powered by an ox or bull driven in a circle. With the passage of time the wooden wheel is replaced by metal.

- Adv Dis
- Reliable
 - Time-taking
 - Irrigation can be used
 - Irrigation limited over
 - Not expensive
 - Efficient
 - Running cost is less
 - Investment cost is high
 - Flexibility



technology (v)
• E

Karez:

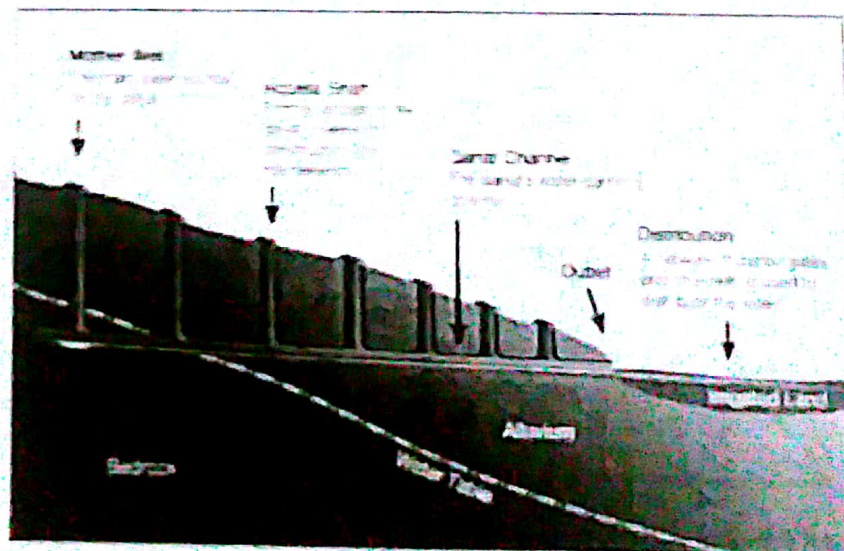
(An underground irrigation channel), it is an underground structure for collecting groundwater and conveying it to the surface. Such structures are in use in the mountainous and foothill areas. Water from a karez is used for water supply and irrigation. Karez tunnels can be as much as several kilometres long. In Balochistan

The Vertical shafts are also dug to collect rainwater or maintain it.

(vi)

Inundation canals:

Inundated canals are long canals taken off from large rivers and it receives water when the river is high enough and especially when it is in flood.



lined canal/canal enters
paving canal ing canal ends
Link canal don't prohibit
water for irrigation
transport water from
one place to another

Modern methods:

remains for
(i) Perennial canals:

- They are linked to dams and barrages to provide water throughout the year and they irrigate a vast area.

(ii) Tubewells:

- Irrigate crop
- Decrease water logging and salinity
- efficient

Dis-
-lowers water
table
- Air pollution
- not all water is used
- less water is used

- Tubewells have diesel or electrically operated pumps that can raise water from the depth of 92 meters (300 feet) to irrigate farms of more than 1000 hectares.
- Tubewells also help to lower the water table thereby protecting the land from water logging and salinity.

(iii) Sprinkler:

- Sprinklers are connected to public water supply pipes.
- They are centrally placed in fields to water the plants.
- They are used mainly in orchards and market gardening.
- It works efficiently with much less water wastage.

Adv



Uses of water:

- Major uses of water are agriculture, domestic and industrial.
- 55% of water is used for the irrigation purposes.

(a) Domestic uses:

- Drinking
- Cooking
- Washing
- Sanitation

(b) Industrial uses:

- Pharmaceutical industry
- Tanning industry(washing, dyeing)
- Food processing (juices, syrups)
- Chemical industry (acids, liquid bleach)

- Textile industry(washing, printing)
- Mineral water industry
- Iron and steel industry.
- Thermal power stations(to produce steam that make the turbine move)
- Hydro – electric power stations.

(c) Irrigation

- Irrigation is an artificial supply of water.
- In Pakistan 75 % of the cultivated area is under irrigation.
- By canal irrigation millions of gallons of water are utilized that would flow into the Arabian Sea.
- Canal system irrigates a vast area. Even the deserts have been made productive.
- Irregular supply of water in the rivers is then regulated by construction of dams and barrages.
- Huge quantities of water from monsoon rainfall and melting of snow can be stored in reservoirs during summer season.

Rainfall
Agriculture
Arid/Semi-Arid

Siltation in Reservoirs:

- The deposition of materials brought by the rivers in the reservoirs is called silt.
- This leads to the decrease in storage capacity of the reservoirs.

(i) Causes:

- Abundance of silt eroded from the Karakoram, Hindukush and Himalayan mountains.
- Deforestation
- Rivers from the narrow and deep valleys in the mountainous areas. Most of the eroded material is washed down into the plains and piles in reservoirs of the dams.

(ii) Effects:

- Blockage of canals because silt accumulates.
- Weakens the foundation of dams.
- Choking of irrigation canals.
- Reduced capacity of reservoir and less flow of water affects the generation of Hydro electric power. it also results in availability of less water for irrigation purposes.
- Flow of flood water is hampered which may cause heavy damage to the dam because of mounds of silt which block the flow of water.

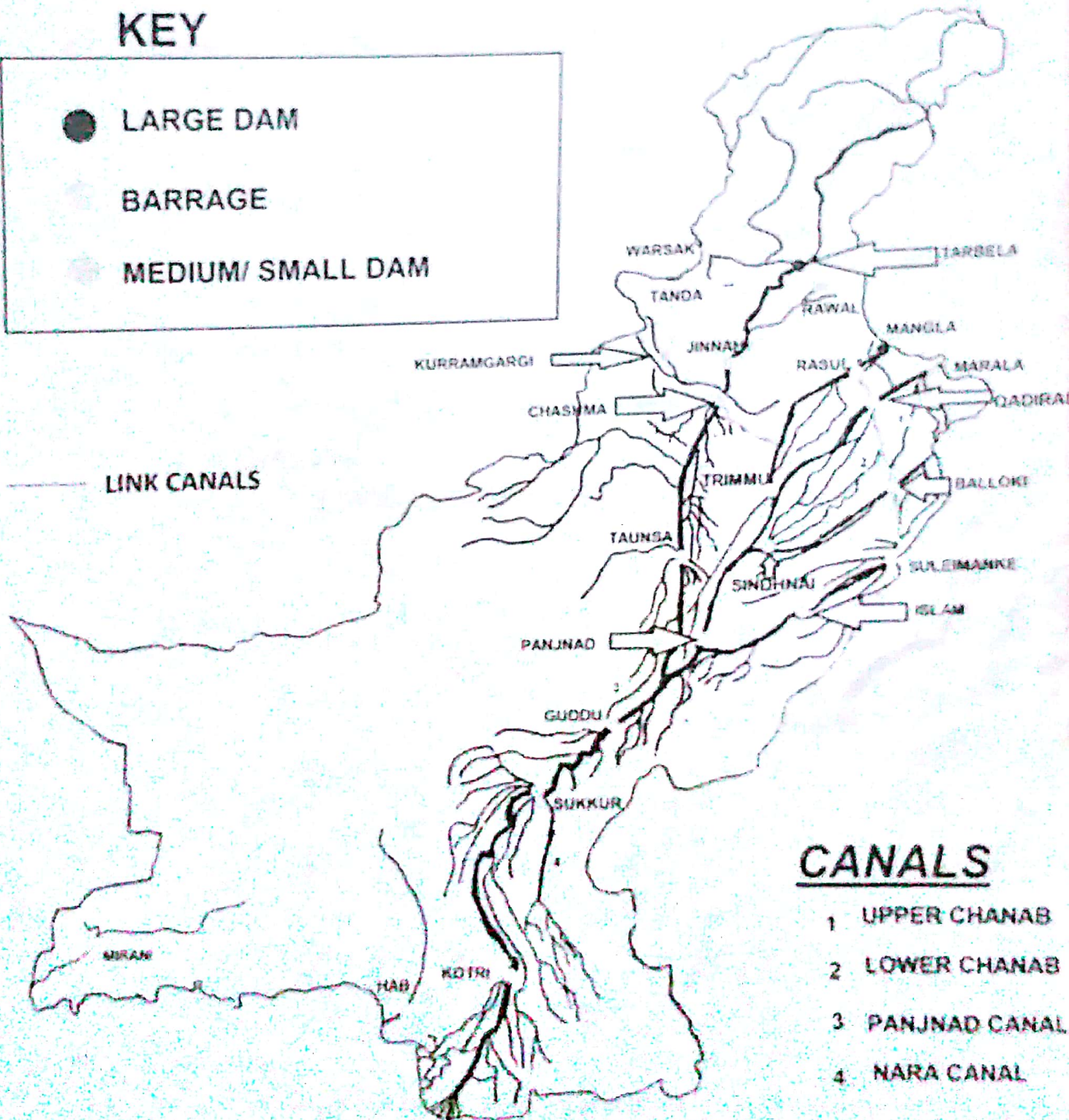
(iii) Control:

- Large scale afforestation especially on the foothills of the Himalayas.

- Cemented embankment of canals to make cleaning easier
- Installation of silt trap before the water flows to the dams.
- Raising height of the dam to increase the capacity of the reservoir.

KEY

- LARGE DAM
- BARRAGE
- MEDIUM/ SMALL DAM



CANALS

- 1 UPPER CHANAB
- 2 LOWER CHANAB
- 3 PANJNAD CANAL
- 4 NARA CANAL

Types of Canals:

(i) Inundation Canals /seasonal canal

- These canals provide water for irrigation only when there is high water table in the rivers.

(ii) Perennial Canals

- These canals provide water for irrigation all year round.

(iii) unlined canals

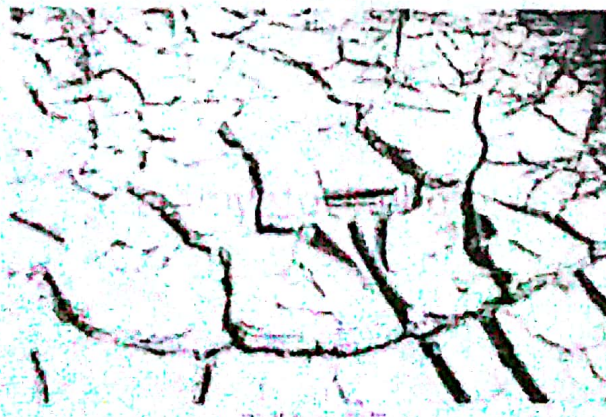
- The canals which do not have concrete or cemented embankments.

(iv) lined canals

- The canals having concrete embankments.

Water logging and salinity:

- The condition when the water table of the ground rises is called water logging.
- When water level comes close to the ground.
- Salinity occurs when ground water rises and evaporates leaving the salt behind.
- Unlined perennial canals and the slow movements of water causes water logging and then salinity.
- This occurs when water from the unlined perennial canals penetrate into the ground causing water logging and salinity.



Solution to water logging and salinity:

(i) Installation of tube wells.

5. C.A.R.P

- Tubewells are installed to solve the problem of water logging and salinity.
- Boring is done 100 meters below the ground using machines.
- Tubewells use electric pumps to lift the ground water.
- After the water is lifted, the water table of the ground goes down.
- Tubewells were used for the first time in 1953 and since then it has become the second largest source of irrigation after canal irrigation.

(ii) planting of Eucalyptus tree

- It is the tendency of eucalyptus tree to be grown in waterlogged areas.
- It absorbs and utilizes the extra water present in the soil.

(iii) Lining of canals.

- Canals are lined from the banks to avoid absorption of water through the banks.

(iv) SCARP programme.

- Water logging can be controlled by the launching of the scarp (salinity control and reclamation project)
- It was framed in 1959 in which the Indus basin was divided into 28 zones.
- WAPDA was given the responsibility to carry out the project.
- Tube wells and surface drains were used to lower the water table and flush out salt from the soil

UNIT 4

FOREST

A **forest** (also called woodland) is an area with a high density of trees. There are many definitions of a forest, based on the various criteria. These plant communities cover approximately 9.4% of the Earth's surface (or 30% of total land area), though they once covered much more (about 50% of total land area).

Having the lowest forest cover even in South Asia is definitely a matter of grave concern but simply regretting this harsh ground reality is not enough, as it requires effective policies to avoid future environmental disasters at least for the sake of coming generations.

A documented report submitted to the Ministry of Environment stated that Pakistan has forest cover of 5.2 per cent while this figure is 70 per cent in Bhutan, 37 per cent in Sri Lanka, 25 per cent in India and 18 per cent in Bangladesh — all of them are third world countries having the same problems as we face in Pakistan.

The latest data provided in the draft of National Forest Policy showed that **Gilgit-Baltistan has highest forest cover that is 27%, Khyber-Pakhtunkhwa 13.9%, AJK 11%, Sindh 4.8%, Punjab 3.1% and Baluchistan has 2.9%.**

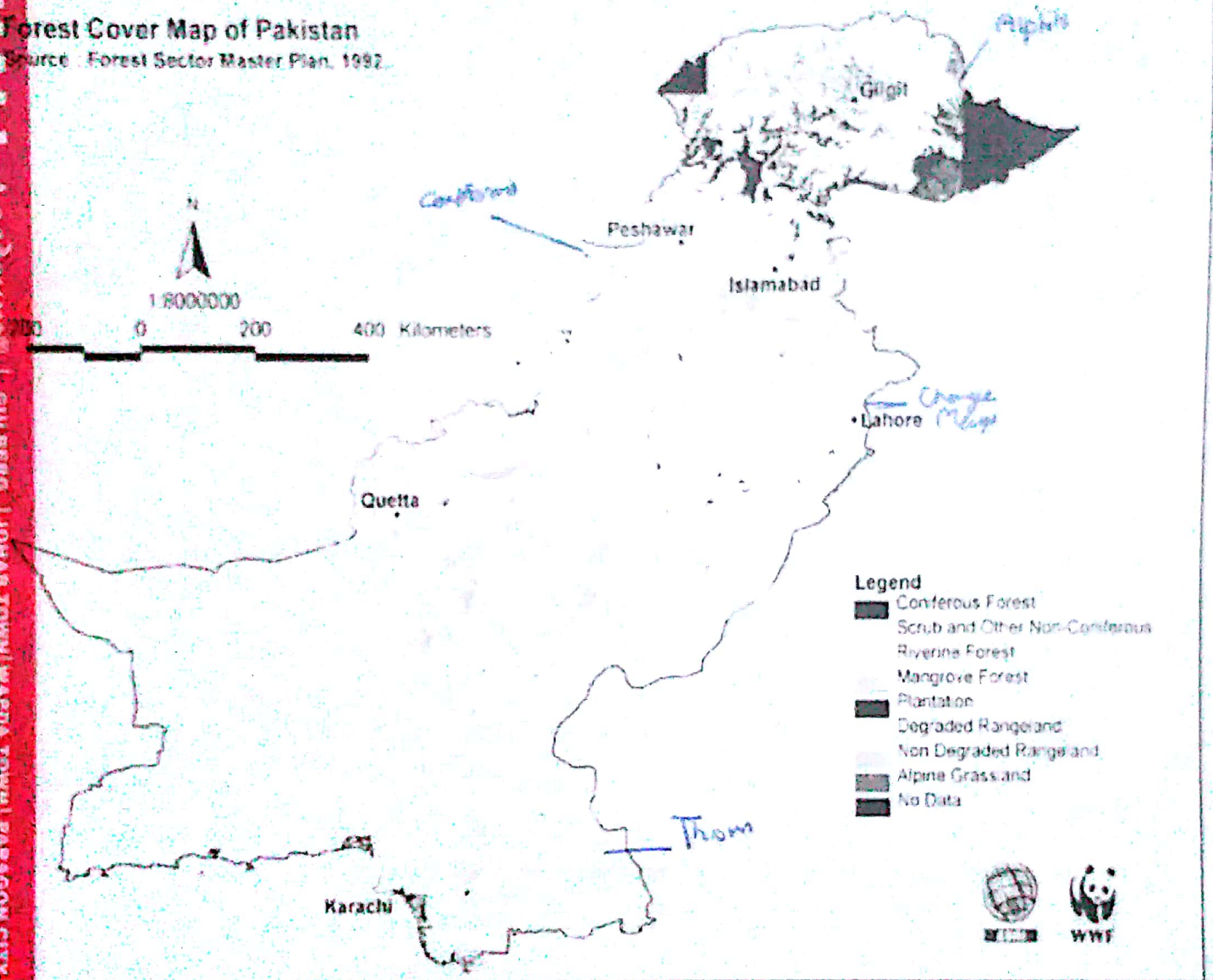
A report of the Ministry of Environment showed the fact that since 1993 there is an absolute ban on deforestation, but maximum area of forestland was declared as non-forest and converted into commercial and residential areas since then.

The intensity of situation can be gauged by only reviewing 'brutal slaughtering' of trees in Murree and its adjoining areas where investors are keen to establish their commercial businesses. The construction of Murree Expressway might be a good step but opportunists found new possibilities for investment and thousands of trees have so far been removed along this road by private housing societies.

The government has set a target to enhance forest cover from 5.2% to 6% by 2016 and it needs concerted and consistent efforts to achieve desired results.

Forest Cover Map of Pakistan

Source: Forest Sector Master Plan, 1992



Key Points:

- A large stretch of area dominated by trees is called forest.
- About 25 % of the total area should be covered with forest.
- In Pakistan forest dominate only 4-5 % of the area.

Types of Forest:

(i) **Productive Forests:**

- The forest which produce wood for furniture, herbs for medicines etc.
- They are thick forest, the canopy is so thick that sapling hardly receives sunlight.

- They can be natural or irrigated forests.
- They are also planted to maintain ecological balance.

(ii) Protective forest:

- These forests are planted to protect the environment.
- They are normally planted along both sides of roads, railways, rivers etc. *upper part of forests*
- The canopy is not as thick as that of production forests.
- They are mostly man made (irrigated) forests but they can be natural as well.
- Their main function is to protect the soil and to prevent it from eroding or blowing away.
- They keep the environment pleasant by lowering the temperature and providing shade.

Types of forests found in Pakistan:

(i) Alpine forests

- They are located in north and north western mountains.
- These forests are located above 4000 meters. *- 5-1000m - snowline is below*
- They are located in snow - covered areas.
- Trees have stunted growth due to low temperature and less sunlight.
- Roots spread sideways on the thin soil to absorb nutrition and to have better grip on the ground.
- Used as fuel wood normally.
- Leaves are directed downwards to avoid snow accumulation.
- Gilgit, Skardu, Chitral, Dir etc are some of the areas where alpine forests are found.

(ii) Coniferous Forests:

- These forests are found at the height between 1000 meters and 4000 meters.
- Due to the availability of optimum environmental conditions, they are ever green forests and rise to the height of 20- 25 meters.
- The top is cone like so these are called coniferous forests.
- Less leaves fall during autumn.
- Evergreen forests survive in low temperature.
- Sloping branches prevent snow accumulation.
- Murree, Abbotabad, Muzafarabad, Swat, Mardan, Rawalpindi, Islamabad, Quetta etc are some of the areas of coniferous forests.
- Cheerch, Deodar etc are some of the species of coniferous. Wood is used for furniture making domestic fuel, Herbs are used for medicine.
- Good breeding and conserving centers for birds and wildlife.
- Add to the scenic beauty of the area.

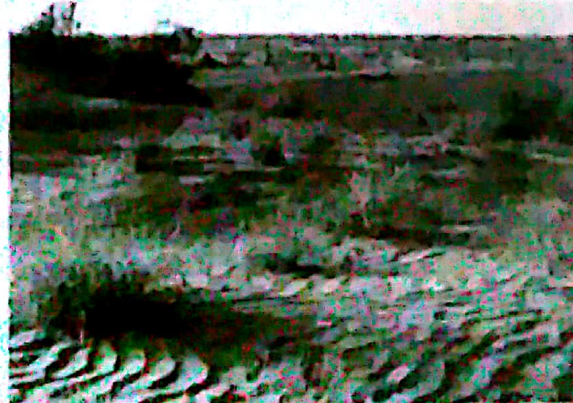


(iii) Subtropical Scrub Forests:

- These forests are located at the foothills of mountains and in plain areas.
- Due to the availability of optimum environmental conditions the trees grow to reasonable good height and remain green for long period of time.
- Sub tropical broad leaved and tropical thorny species.
- Shisham, Babool, Diar, Willow etc are some of the species.
- Wood is used for furniture making, sports goods, and fuel wood by the local people.
- These forests are also used for grazing purpose.
- Gujrat, Sheikhpura, Sialkot, Gujranwala, Peshawar, kohat mardan are some of the places.

(iv) Tropical Thorn Forests (Rakh) :

- These are found in Punjab plains, southern and western Baluchistan and in Sindh plains.
- Due to lack of optimum conditions trees do not attain good height (6 to 10 meters).
- Trees are mainly thorny bushes.
- Deep roots to search for water
- Wood is used as fuel wood by the locals.



(V) Riverain or Bela Forests:

- These forests are found in the Active Flood Plains of river Indus and its tributaries.
- Linear plantation along the banks of rivers.
- As the optimum environmental conditions are met so the trees grow to good height.
- Species like Eucalyptus, Popular, Shisham, Babul etc are grown there.
- Wood from these forests is used in furniture making, sports goods making, papermaking etc.



(vi) Mangrove Forests:

Threats to mangroves

1. Nutrient soil is not provided due to construction of dams and barrages.
2. Cutting for fodder and firewood.
3. Sea water pollution.
4. Removal of sand from beaches.

Importance of Mangroves

- Firewood
- Timber (Furniture)
- Breeding for fish
- Fodder for livestock
- Protects from sea erosion
- barrier against hurricanes & storm

- These forests are found in coastal areas of Sindh and of Baluchistan.
- The conditions required by the mangrove forest are in the coastal areas.
- They grow in salty water of the sea and require marshy soil.
- These forests do not grow to good height as their roots remain in water all the time. In better water areas, the trees rise to 6-8 meters but their general height is 3 meters.

Mangroves are salt tolerant trees adapted to live in harsh coastal conditions. They contain a complex salt filtration system and complex root system to cope with salt water immersion and wave action. They are adapted to the low oxygen conditions of waterlogged mud.



(vii) Irrigated Forests:

- These forests were planted mainly by human.
- These can be both productive and protective forests.
- Changa Manga is such a forest; other locations are Chicha Watni Guddu barrages.
- The British planted these to provide fuel wood to run locomotives.
- These are planted in the linear style on both sides of roads, railways, canals etc.
- They are planted to protect environment, to protect wood for furniture, for sports goods manufacturing, solution to water logging and also use for paper making.



Deforestation:

- The removal of trees on large scale is called Deforestation.

Reasons:
- Urbanization
- Timber for industry
- Firewood
- Grazing
- Mining
- Clearing of land for roads

Sustainable forestry:

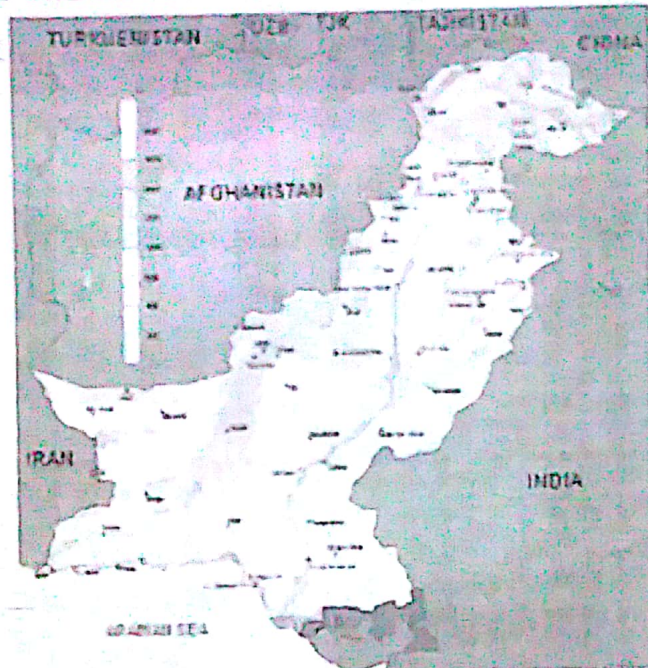
- SF means that we should manage the forest resources in such a way as to ensure that we will be able to obtain the things that we want from the forests on regular basis while conserving the natural environment.

Sustainable forestry refers to the use of forest lands in a way and a rate that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill now and in the future.

Afforestation project

UNIT 5

FISHING INDUSTRY



Fishing is the activity of catching fish. Techniques for catching fish include hand gathering, spearing, netting, angling and trapping.

The term fishing may be applied to catching other aquatic animals. The term is not normally applied to catching aquatic mammals, such as whales, where the term whaling is more appropriate, or to farmed fish. In addition to providing food, modern fishing is also a recreational pastime.

With a coastline of 814 km, Pakistan is rich in fishery resources that remain to be fully developed. Almost the entire population of the coastal areas of Sindh and Baluchistan depends on fisheries for its livelihood.

To exploit potential fishery resources, the government has undertaken such projects as construction of a modern harbor for fishing vessels at Karachi, procurement of diesel-powered vessels, establishment of cold storage and marketing facilities, export of frozen shrimp, and encouragement of cooperative fish-marketing societies. An aquaculture project financed by the Asian Development Bank and the EU aimed to increase the annual fish catch and to promote prawn farming.

KEY POINTS:

Introduction:

- Fishing is one of the oldest occupations for people who live near lakes, rivers and the sea.
- With the progress of civilization fishing communities started breeding fish.
- This is called fish farming or aquaculture.
- In Pakistan there are many fish farms inland using man made rectangular ponds as well as using protected areas in rivers and lakes.

- Marine fishing now includes some modern developments in the processing and exporting of the catch.
- Fishing industry has a share of 0.9 % in Pakistan's GDP.
- Pakistan earns 6 % of its total foreign exchange earnings by exporting fish, shrimps and fish products.
- Fishing is the main occupation in the coastal settlements of Sindh and Baluchistan.
- The total number employed in fishing is 395000. Out of which 125000 (31.6%) are engaged in marine fishing and 270000 persons (68.4%) in inland fishing. But the marine catch is nearly three times that of the inland catch.

Fishing Areas and methods:

Marine Fishing:

- Pakistan has a coastline divided into Sindh (30%) and the Makran(70%) coasts.
- In Sindh Karachi is the main fishing centre.
- On the Makran coast fishing ports are small, often no more than villages like **Sonmiani** and **Jiwani**. **Gwader** is the most important fishing port on this coast. Gwader besides Ormara and Pasni is being developed as a fishing centre by providing improved facilities such as Ice factory, refrigeration plants and modern fish curing yards.

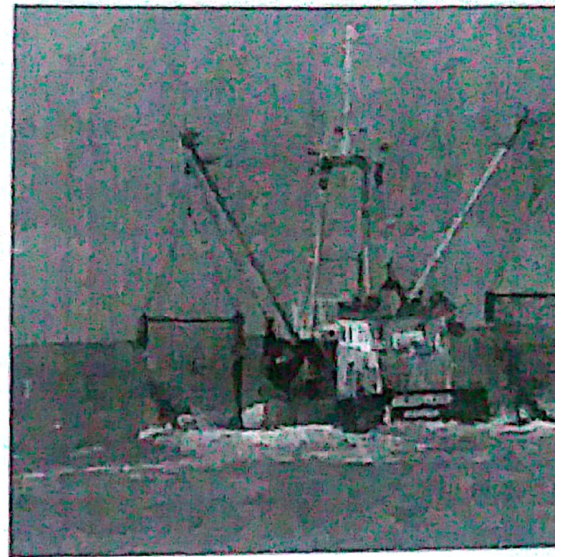
Types of Marine Fishing:

1: Subsistence fishing:

- In subsistence fishing fisherman and his family consume the fish they catch.
- Fish is the main component of their diet that lives on coastal areas.
- Subsistence fishermen uses conventional techniques like the traditional net, a small wooden sail boat which does not travel far out to sea. *Weather forecast system is not followed. Small ice baskets for preservation*



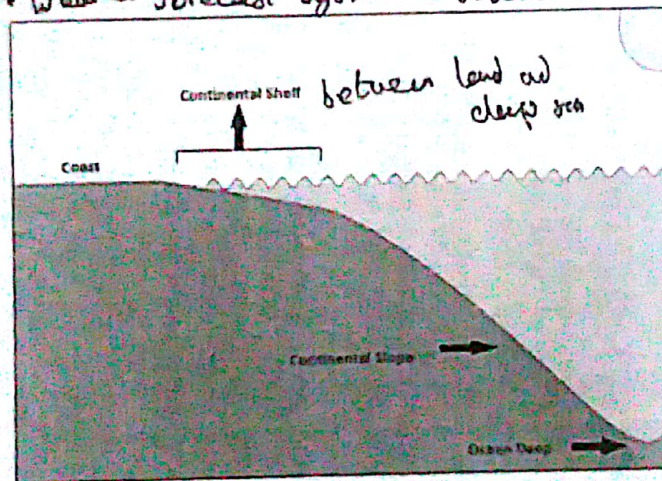
2: Commercial fishing:



- In commercial fishing fish is sold in the market.
- Fishing communities depend on fishing as the sole source of their income.
- 68 % of the total marine catch is at Sindh coast.
- Sindh coast is more developed because it has numerous creeks, sheltered harbors and a wide shallow sea beyond.
- It has a wider continental shelf than the Makran coast.
- The Indus delta is rich in fish food much of which is brought down to the delta by the river Indus.
- It has better export and processing facilities.
- In commercial fishing the gill netters and mechanized boats have made it possible to fish 50-60km from the coast in deep sea water.
- In Karachi the government has developed the Korangi fish harbor where storage and packing facilities are available to fisherman.
- Weather forecast system is followed

• Value-added products

• Refrigeration plants
• Canning procedures



Types of Marine Catch:

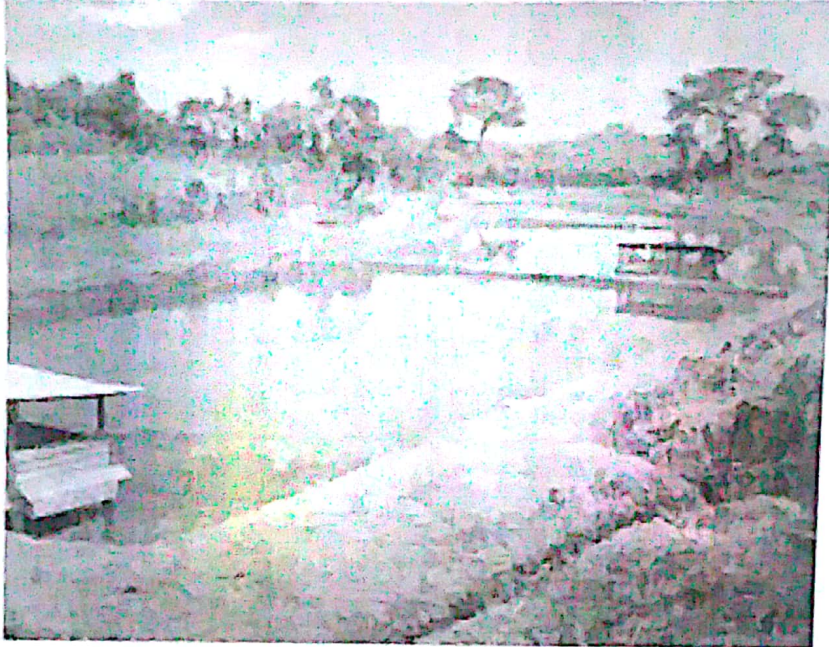
- Sharks
- Drums
- Croakers
- Cat Fish
- Skates
- Rays

Inland Fishing:

- Inland fishing is practiced in almost all the rivers and lakes in the country.
- The large reservoirs behind Dams, the lakes of Sindh and irrigation channels are all utilized for fish farming.
- Dug ponds have also been made for this purpose.

Fish Farm:

- Fish farms are rectangular man made ponds for breeding of fish.
- They have a concrete or cemented impervious base to prevent water losses through leakage.
- The side of the farm is edged with solidified mud.
- Trees are planted around the fish farms to keep the water cool.



Main Fishing Center:

- River Indus at Sukkar, Kotri and Thatta.
- Manchar Lake in Dadu district.
- Kairi (Keenjhar) Lake north of Thatta.
- Haleji Lake west of Thatta.
- Reservoirs of Mangla and Terbela Dams.

Types of inland fish:

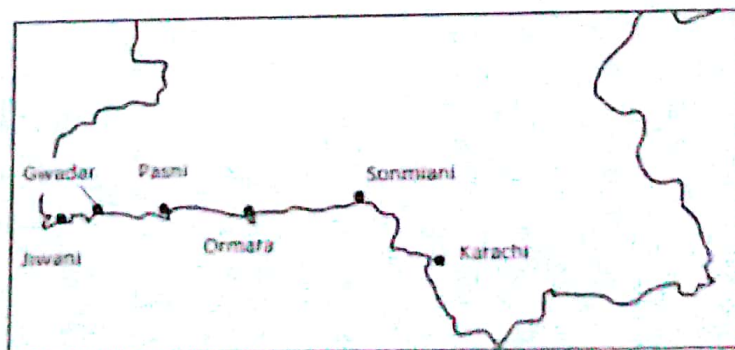
- Manaseer
- Palla
- Thalla
- Rahu
- Trout

Fish Marketing:

- Pakistan has a domestic and an international market for fish, shrimps and fish products.
- At the domestic level the catch from marine fisheries is supplied to the local fish markets through wholesale dealers.
- Karachi is the main fishing centre where street hawkers also buy some of the fish catch and provide a door to door service.
- Frozen or processed fish is supplied to only a few large departmental stores in urban areas because people prefer to buy fresh fish and prawns rather than the processed ones.
- However the local demand for fish is less than its catch.
- The per capita consumption is 1.6 kg p.a, which is quite low as compared to the European countries where it is 20 kg p.a.
- About 30% of the total fish catch is exported to 30 countries of the world.
- Japan is the main market for fish and shrimps.
- USA, UK and France are other markets.
- About 80 % of the total fish catch of the Makran coast is dried for export to the Middle East.

Sustainable Fishing

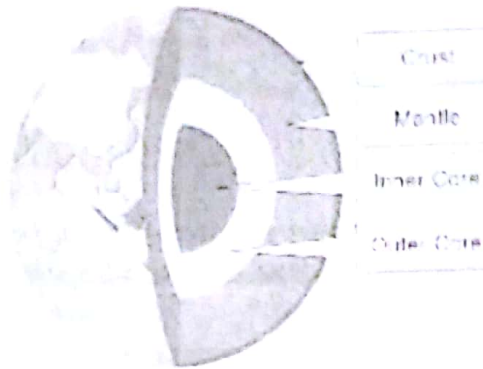
- Fishing of endangered species of fish must be banned to allow stocks to recover
- Nets with certain size of holes be used to avoid by catch of smaller fish
- Illegal fishing must be stopped as they do not conform to rules and regulations. Like they catch smaller and immature fish to maximize profits, unfortunately they can't breed so stocks are destroyed
- Quotas must be set for countries in international water



UNIT 6

MINERAL RESOURCES

→ how minerals form
→ Extraction of minerals
→ origin
→ usage
→ cement formation
→ Sustainable
→ Threat to Mining Solutions



A mineral is defined as being a naturally occurring element or compound that is formed by inorganic processes and contains a crystalline structure.

Geographers are primarily concerned with minerals in soil because minerals form the basic framework of soil.

Minerals originally form when **once-heated Earth material magma** (molten rock) cools and forms solid igneous rock. The Earth's crust formed and continues to form in this manner.

Earth's crust contains a combination of naturally occurring elements, of which following elements are predominant: silicon, aluminum, iron, calcium, Sodium, potassium, and magnesium. As you can imagine, combinations of these elements along with the other naturally occurring elements that form Earth's crust produce a wide variety of minerals.

Igneous rocks contain original minerals that form as magma cools but **sedimentary rocks** are formed by secondary minerals that grow and join sediment particles together and become cemented. **Metamorphic rocks** were once igneous rocks and sedimentary rocks that become chemically altered to form different minerals.

Key Points:

Formation of minerals:

- Over 3000 minerals are currently known and about 50 new discovered each year.
- Some minerals are originally formed from hot **magma**, which contains the minerals. When the magma cools crystals of minerals appear.
- Most of the minerals are formed underground when **heat and pressure** transform one form of rock into another.
- **Decomposition** of leaves, plants and bones, flesh ultimately transform into minerals but it takes million of years.

- Mostly this process of decomposition happens in oceans where thousands of species dies every day.

Mining processes:

- Mining is a process of digging rocks and minerals from the earth.
- Minerals are found at different depths.
- There are three main methods of mining.

(a) Open cast mining:

- Some minerals like coal and iron often lie near the surface.
- Open cast mining scoops up these minerals from near the surface with the help of giant excavators and power shovels.
- Which then load the material into Lorries or railway wagons to be carried away.

(b) Under ground Mining:

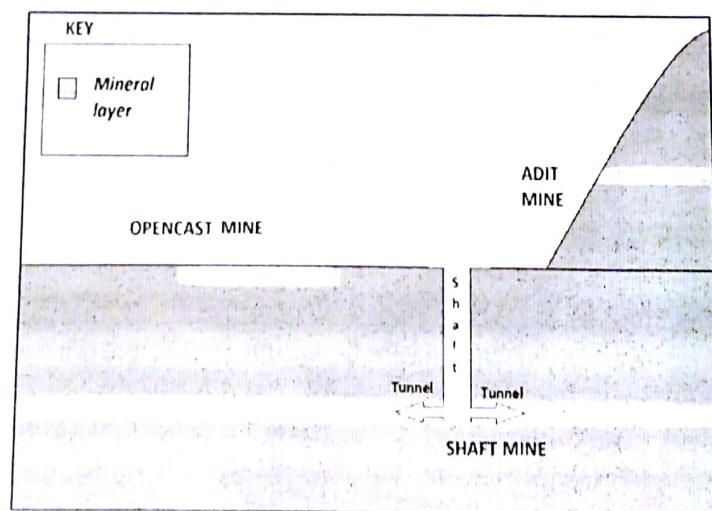
- There are two methods by which minerals are accessed underground.

(i) Adit mining:

- An adit is an opening or passage.
- Adit mining is done in hilly districts where a mineral seam is exposed on a hill side.
- Horizontal tunnels are dug into the side of a valley or hill to reach the mineral deposit.

(ii) Shaft mining:

- Vertical shafts are dug down to the minerals, especially for coal.
- This method is expensive and can be dangerous.



Metallic and Non metallic minerals:

Mineral with impurities

- Metallic and non metallic are one of the mankind's most highly prized possessions.
- Many of our articles are made from metallic minerals.
- Few elements such as gold and copper occur in pure form as "metallic minerals", but most are found as "ores".
- **Ores** are compounds containing a high proportion of the metal.
- These metallic ores are cut or blasted from surrounding rock. The ore is crushed and the worthless rock removed.
- Mineral resources are non renewable although many can be recycled and used again.

Q: Metallic and non-metallic

Metallic minerals are:

Non Metallic minerals are: *mixed*

- Iron ore
- Copper antimony
- Chromites
- Celestite
- Manganese
- Gold
- Silver
- Tin
- Bauxite

- Coal
- Sulphur
- Rock salt
- Gypsum
- Soapstone
- Limestone
- Marble
- Clays

Organizations for mining in Pakistan:

- **Geological Survey of Pakistan**, started working in 1947.its main function was to investigate the minerals deposits.
- **Pakistan Mineral Corporation** started working in 1974.its main function was to explore and market all the minerals. The **Pakistan Mineral Development Corporation (PMDC)** is an autonomous corporation attached to the Ministry of Petroleum and Natural Resources, of the Government of Pakistan.
- **Resource Development Corporation** started working in 1974.it used to investigate and develop copper mines at Saindak, Balochistan.
- **Gemstone Corporation of Pakistan** established in 1979.its main aim was to develop gemstone resources.

DIFFERENCE BETWEEN METALLIC AND NON METALLIC:

Metallic Minerals:

- I. Metallic minerals are those minerals which can be melted to obtain new products.
- II. Iron, copper, bauxite, tin, manganese are some examples.
- III. These are generally associated with igneous rocks.
- IV. They are usually hard and have shines or luster of their own.
- V. They are stretchy and flexible.
- VI. When hit, they do not get broken.
- VII. Good electrical conductor

Non-Metallic Minerals:

- I. Non-metallic minerals are those which do not yield new products on melting.
- II. Coal, salt, clay, marble are some examples.
- III. These are generally associated with sedimentary rocks.
- IV. They are not so hard and have no shine or luster of their own.
- V. They are not ductile and flexible.
- VI. When hit, they may get broken into pieces.
- Poor electrical conductor

Description and uses of metallic and non metallic minerals:

(i) Rock salt:

- Seams of rock salt vary in thickness from between 20 to 100 meters.
- The rocks are whit and pink in color.
- The salt is overlain by gypsum and clay.
- Rock salt is used for cooking and preservation purposes and for the manufacture of soda ash, caustic soda and other sodas for laundries, textiles and tanning.

(ii) Brine:

- Used in chemical and fertilizer industry.

(iii) Limestone

- Limestone is a major sedimentary deposit and is widespread in Pakistan.
- It is the main raw material for cement.
- It is also used in the manufacture of bleaching powder, glass, soap, paper, paints and lime.
- It is used to treat sugarcane waste to produce alcohol fuel.
- It is painted on barks of trees to counter pests and termite attacks.

(iv) Coal

- Pakistan has low quality coal is mainly used in brick kilns.
- Some is use to make coal.
- A small percentage is used for power generation.
- Thermal power stations are also being run by coal.

(v) Natural gas;

- Gas is being used in Domestic and industrial uses.

(vi) Gypsum:

- Found is grey, white and pink color.
- It is used in the manufacture of paints, fertilizers and pre - fabricated construction boards.
- White gypsum is used for making cement and plaster of Paris.
- Spread on saline soil to help land reclamation for farming.

(vii) Marble:

- Found in bands of white, grey, yellow and brown.
- It is used in buildings and for making chips for flooring and decorative pieces.

(viii) Clays

- China clay is used in the ceramic industry, for a special type of cement and has other industrial uses.
- Fire clays fine clay capable of enduring high temperature to make fire bricks; it is also used to make pottery and chemicals.

(ix) Magnetite

- It is used in the manufacture of cement, fertilizer, rayon, paper pulp, chemicals and pharmaceuticals.

(x) Sulphur

- Sulphur is used in chemical industries to manufacture sulphuric acid, paints, explosive materials, rayon and fertilizers.

(i) Chromite

- Chromite gives hardness and electrical resistance to steel.
- It is used for bridges and railways carriages.
- It is also used in metallurgical furnaces and for making engineering tools and stainless steel etc.

(ii) Iron ore

- Steel making, construction and the transport industry.

(iii) Copper

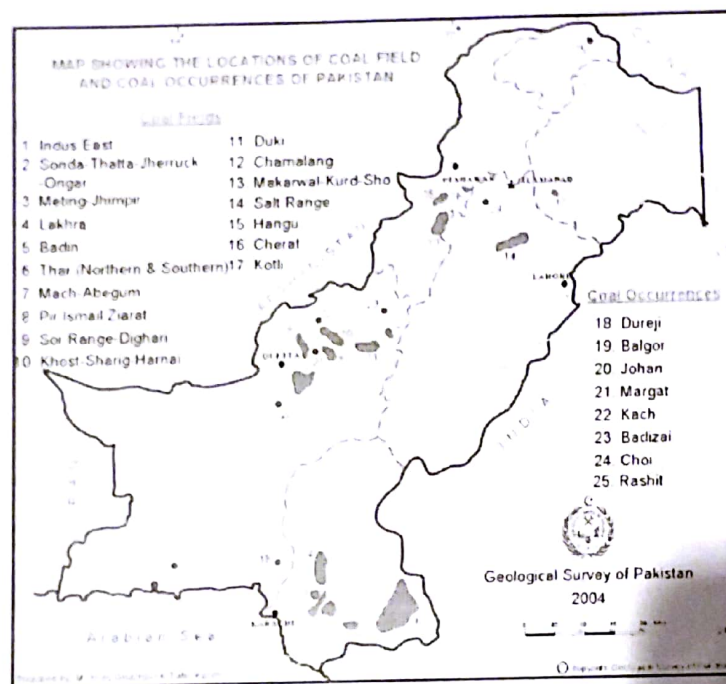
- Making electrical wires and other electrical appliances especially switches that carry current.
- It is also used in making alloys, water pipes and tanks.

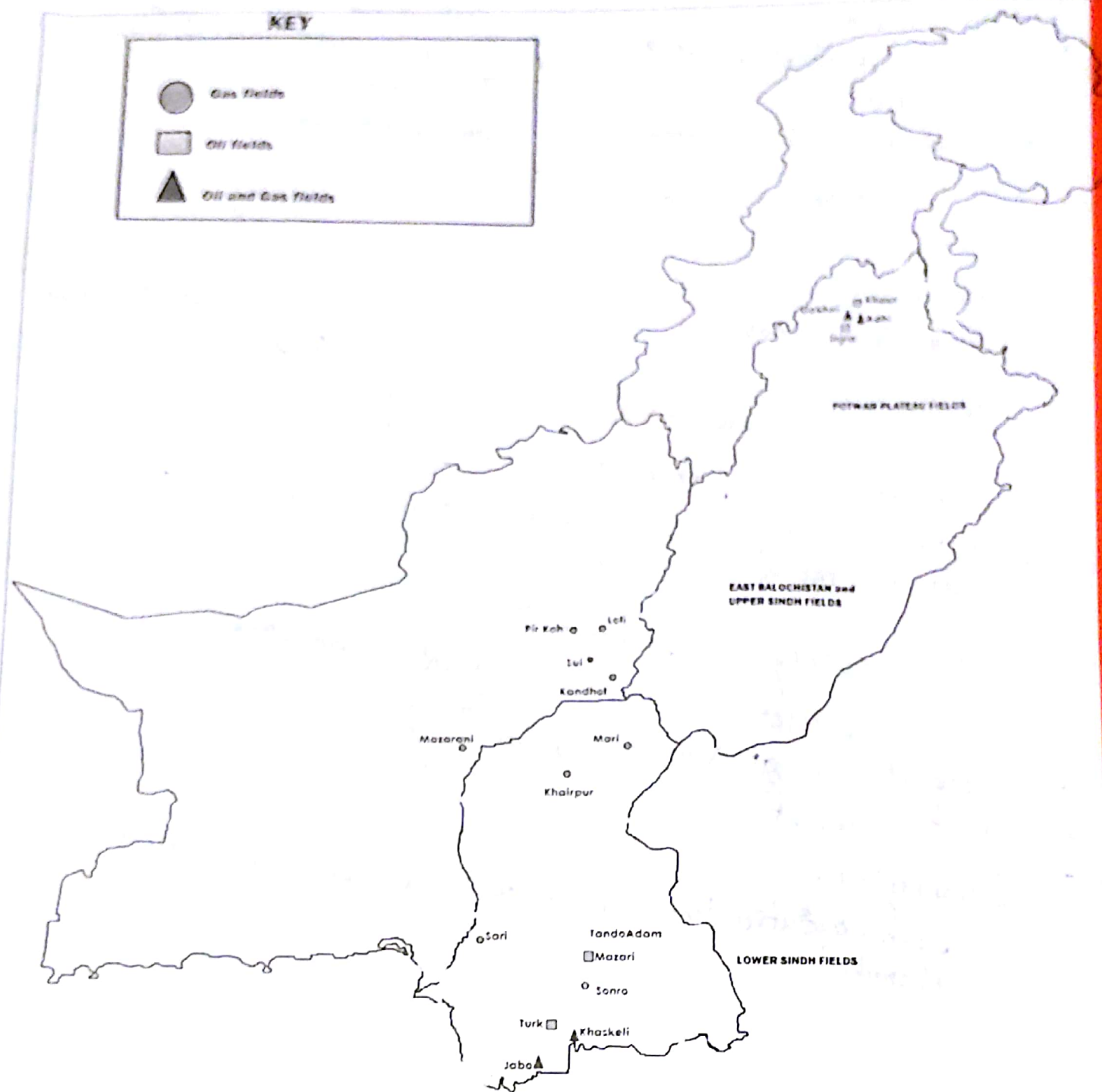
(iv) Maganese

- Used in making dry batteries and paints.
- It is vital alloy in steel making.

(v) Bauxite

- It is used in utensils, tins, cans etc.





Threats of mining; mining waste
Pollution, water, noise, air, dust, smoke
Vegetation cut down
Depressions are caused after digging
Ground vibration
Natural landscape could be destroyed

Health facilities are not provided to Miners;

Katcha miners/children

Pokhar miners; professional

Donkey miner; donkeys are transportation

How cement is made/ingredients;

- Non metallic minerals like limestone, chalk and clay are mixed together/crushed together

- heated in rotary kiln (construction)

- Coal/oil is used as a fuel

- Kiln products are mixed with gypsum to make cement.

prevents it from setting it too quickly after water is added.

Quarrying;

Open excavation from which any useful stone or mineral can be extracted

Solutions;
Filtration plants
Reforestation
Mining on scientific lines; surveys
Mining waste should be dumped
Land should be levelled

Threats to mining;

- No skilled labour / Lack of technical knowledge
- Institutional mining agencies / No interest
- Security threats
- Financial constraints
- Inaccessibility
- Low priority
- Lack of infrastructure

AGRICULTURE AND LIVESTOCK.

PAKISTAN



Pakistan's principal natural resources are arable land and water. About 25% of Pakistan's total land area is under cultivation and is watered by one of the largest irrigation systems in the world. Pakistan irrigates three times more acres than Russia. Agriculture accounts for about **23%** of GDP and employs about **44%** of the labor force. Pakistan is one of the world's largest producers and suppliers of the following according to the 2014 Food and Agriculture Organization of The United Nations given here with ranking:

- Apricot (4th)
- **Cotton** (4th)
- **Sugarcane** (4th)
- Milk (5th)
- Onion (5th)
- Date Palm (6th)
- Mango (7th)
- Oranges (8th)
- **Rice** (8th)
- **Wheat** (9th)

Pakistan ranks **fifth** in the Muslim world and **twentieth** worldwide in farm output.

Crops

The most important crops are wheat, sugarcane, cotton, and rice, which together account for more than 75% of the value of total crop output.

Pakistan is a net food exporter, except in occasional years when its harvest is adversely affected by droughts. Pakistan exports rice, cotton, fish, fruits (especially Oranges and Mangoes), and vegetables and imports vegetable oil, wheat, cotton, pulses and consumer foods. The country is Asia's largest camel market, second-largest apricot and ghee market and third-largest cotton, onion and milk market.

Livestock

According to the *Economic Survey of Pakistan*, the livestock sector contributes nearly 11 per cent of Pakistan's GDP.

KEY POINTS:

What is agriculture?

- Agriculture is a **primary** industry concerned with obtaining raw material from the ground for immediate consumption or for further processing.
- All types of agriculture can be viewed as a system with **inputs**, **processes** and **outputs**.
- The inputs determine the type of processes on the farms. The result of what the farmer does is the output.
- The **inputs** fall into two groups.

(i) NATURAL (Physical)

- The factors of nature that affect the possibilities for different crops and animals .e.g. Land, Soil, climate, water.

(ii) HUMAN (economic)

- The involvement of the human beings through capital, machines, fertilizers, labor, knowledge, land ownership, traditions, irrigation, pesticides, *labour, traditions*

Types of farming:

(a) Small scale subsistence farming:

(b) Cash Crop Farming:

Cropping seasons in Pakistan:

- There are two cropping seasons.
- The crops that are sown at beginning of the winter season, from October to November and harvested in early summer from April to May are known as **Rabi** crops.
- The crops that are sown in summer April to June and harvested in early winter from October to November are known as **Kharif** crops. They are rice, sugar cane, millets, maize and cotton.

MAIN CROPS:

I: wheat: *Rabi crop*

- It is a staple food used in manufacture of bread and a variety of baked products.
- Low grades of wheat and by products of the flour are used as feed for livestock.
- The canal irrigated areas of Punjab and Sindh meet most of the requirements for wheat.

- Waterlogged areas of the Indus plain are not suitable for the cultivation of wheat.
- Wheat is grown in few areas of KPK and Baluchistan.

Cultivation of wheat:

- In **Oct. – December**, after plowing the field, wheat seeds are sown directly into the ground.
- Wheat does **not** need a lot of water.
- Farmers irrigate the land twice, the first irrigation is done one month after sowing and the second is done one irrigation takes place one month before harvesting.
- Wheat is harvested after three months.
- **Chaff** is separated from the grain; the grain is then stored by the farmer for the use of his family or transported to the market.



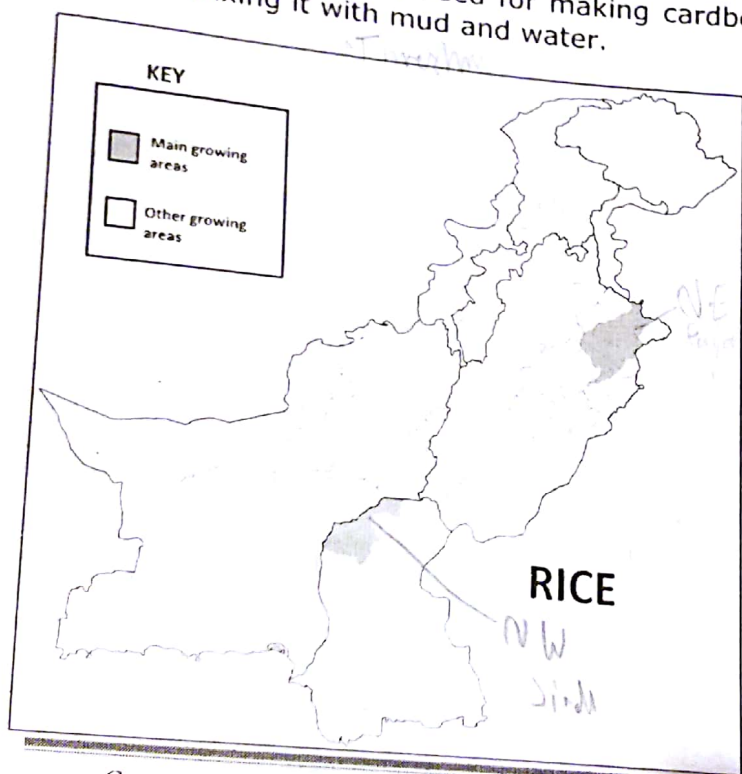
Growing wheat production:

- The yield of wheat has gradually increased in Pakistan with the introduction of **new wheat varieties** and improved farming methods.
- There is improvement in the water management system to cut down water losses from the **canals** to the fields.
- Chemical **fertilizers** are becoming more widely used.
- Government is providing **loans** on easy installments to purchase tractors etc.
- But Pakistan is rarely self-sufficient in wheat because of ever increasing population and gradual decrease in cultivable area due to water logging and salinity.
- **Maxi pak** is one of the most widely used varieties in Pakistan.

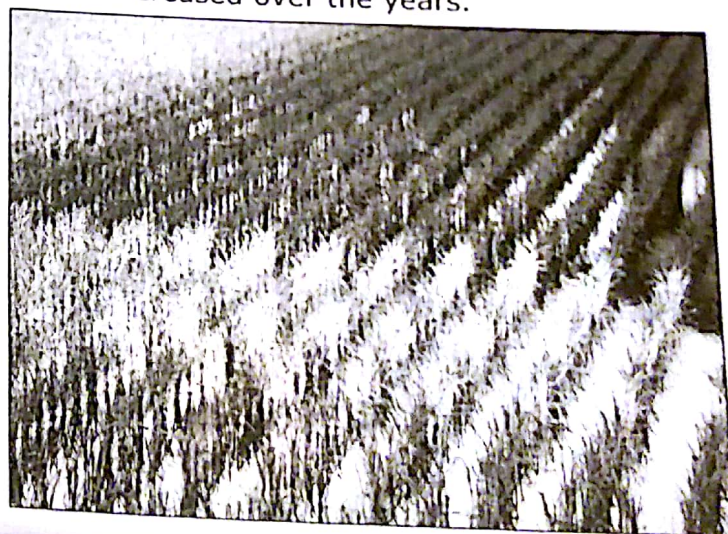


2: RICE:

- Rice is grown on a large scale for commercial purposes in Punjab and Sindh.
- In the northern hilly regions small scale subsistence rice farming is practiced.
- Rice seeds are **initially sown into beds or nurseries**.
- When the plant is about **9 inches** high, it is transplanted into the prepared fields which have flooded to a depth of 30 - 37 cm.
- The rice fields are kept full of water until the rice is ripe.
- Threshing of rice is either done by draft animals or by a mechanical thresher.
- After threshing, rice is taken to the rice mills for polishing and packing.
- Rice **husks** are used for making cardboard or covering roofs of houses after mixing it with mud and water.



- Use of **Irri Pak** variety has doubled the production of rice.
- Export of **basmati Rice** has increased over the years.





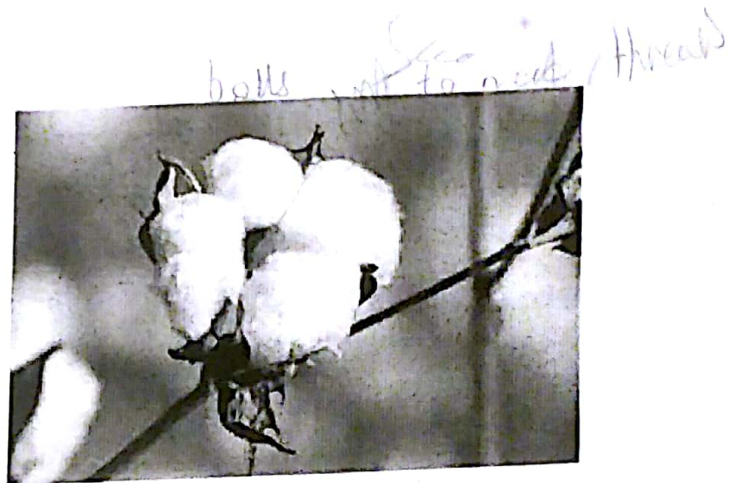
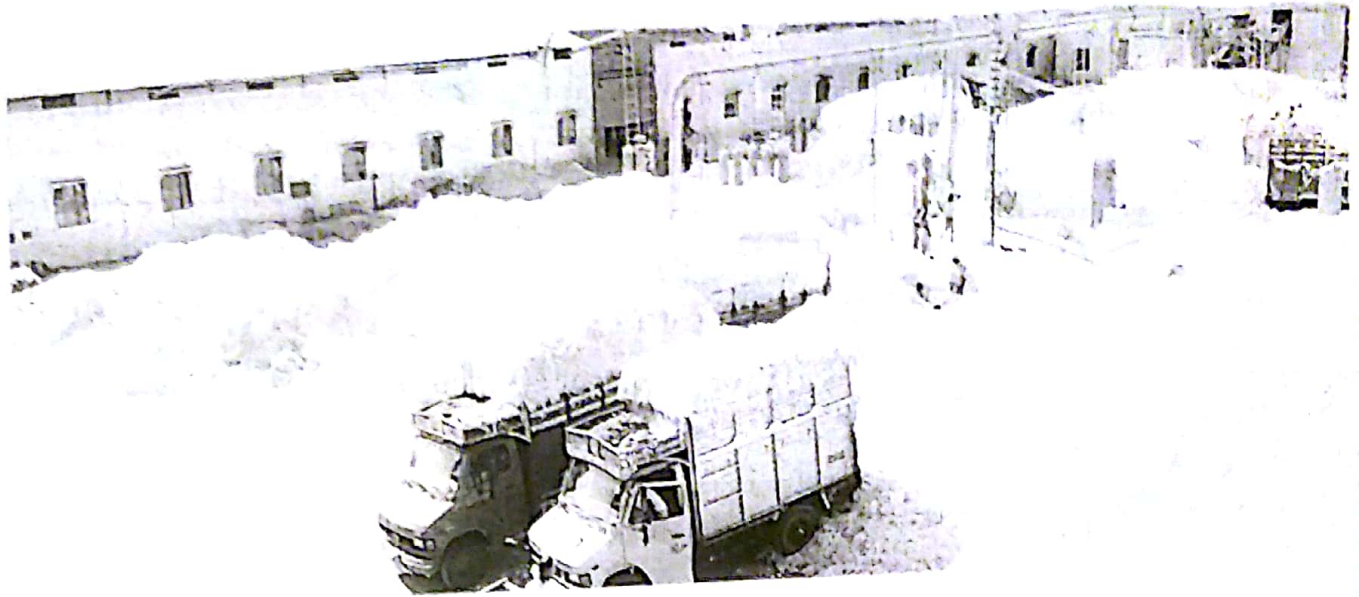
3: COTTON:

- Cotton the king of fiber is the most widely used textile fiber.
- Used in making cloths, furnishing fabrics, bed linen.
- It is a kharif crop.
- Cotton seeds are sown at a distance apart of 30 cm to 45 cm in April - May.
- One month later the fields are irrigated.
- A second irrigation takes place after a further two months.
- Cotton bolls ripen in the dry months of October and November.
- The plant reaches a height of up to 135cm to 150 cm.
- After picking cotton bolls are loaded onto trucks immediately and transported to ginning mill where the seeds are separated from the **lint** (fluffy mass of fibers inside the cotton boll).
- Cotton seeds are used as animal feed and for the extraction of oil.
- Cotton lint is tied up in bales. *and yarn is made*

Q: Threats to cotton crop.

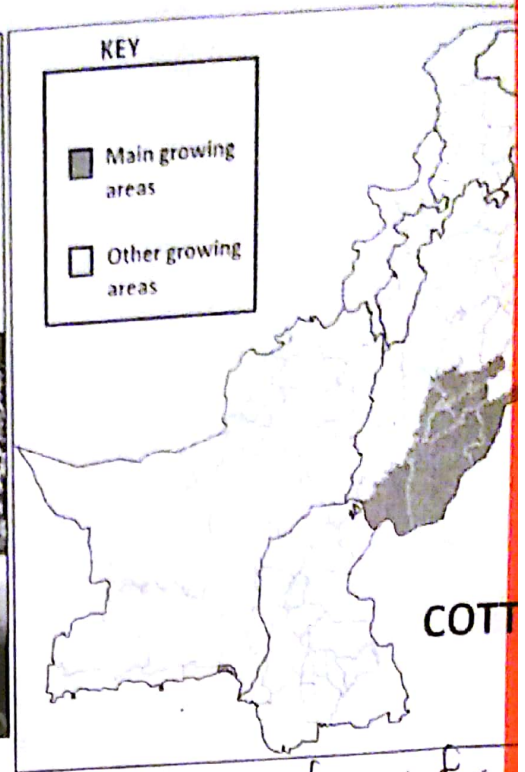
- *Leaf curl virus and fruit shedding*
- *Sensitive to frost*
- *Rain at the time of picking spoils the crop*

Q: Threats to industry



Varieties of cotton:

- Old varieties like Pak. Upland and Desi.
- High yielding varieties like Nayyab 78, B-557, 149 - F

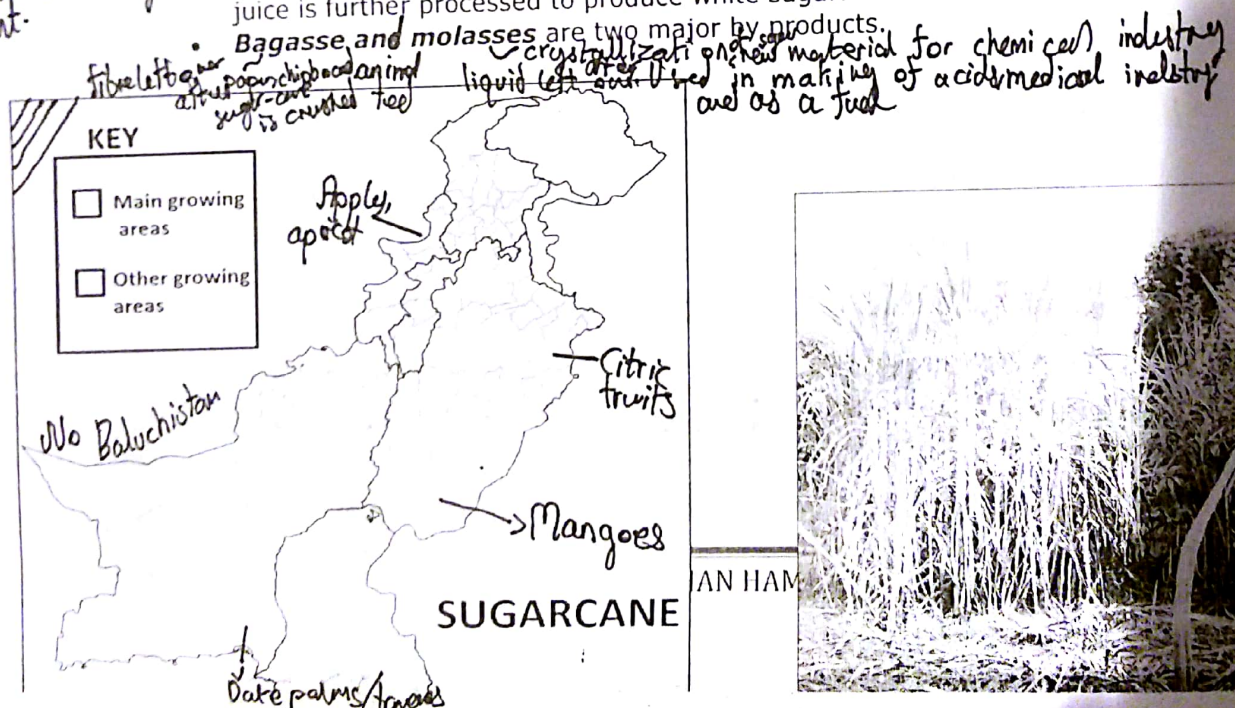


Lasbela are famous for cotton crop

4: SUGAR CANE:

Q: Why sugar-cane is transported immediately?
 A: Heavy and bulky and becomes heavy to transport.
 • If transportation is delayed the sugar content is reduced and starts losing weight.

- Sugar, brown sugar and Gur are made.
- Sugar cane stalks 30 cm high are planted in April to May.
- A distance of 30 cm is kept between each stalk.
- The quality and height of sugar cane depends upon proper irrigation and fertilizers (potash).
- The height reaches to 6 to 7.3 feet and the crop can be **rattooned** and so harvested for 2-3 years.
- After the sugar cane is harvested it sends up new shoots called rations and these left to grow so that they can be harvested in the following years.
- Cutting sugar cane requires manual labor.
- At the sugar mill the cane is scrubbed to remove the smell and dirt.
- After extracting the juice by crushing the cane through heavy rollers, the juice is further processed to produce white sugar.





5: MAIZE: [Corn]

- It's a kharif crop.
- It's a food grain as well as a raw material for edible oil production.
- It is used in the manufacture of corn flour, custard powder and other processed foods.
- It's also used as fodder for animals and poultry.

6: PULSES:- Daals

- Pulses are rich in proteins and are popular in the local diet.
- Pulses fix nitrogen in the soil therefore helping to fertilize the crop that follows.
- Pulses are considered as low value crops because the cash returns are low and consequently inputs are minimal.
- Important pulses are Mung, Mash, Grams, Masoor.

7: MILLETS:

- Jowar and bajra are two millets produced.
- They are fodder for animals, poultry.

8: OIL SEEDS:

- Oil seeds like sunflower, soya bean, rape seed, mustard, sarson, rai, linseed are used to extract edible oil.
- The production of oilseeds is not sufficient to cater for the needs of the growing population.
- 68 % edible oil is being imported.

9: TOBACCO: Not a food crop

- Tobacco is grown mainly in NWFP (mardan peshwar), which accounts for about 65 % of the total production.

Crop	Rainfall (mm)
Wheat	450 - 600
Rice	1200 - 2000
Sugarcane	1500 - 2000
Cotton	750 - 1300
Tobacco	400 - 600
Citrus	1000 - 1200

Poultry farming:

Practice of raising poultry
e.g. chicken and eggs for
farming meat and eggs for
food

Processes

1. Suitable building
2. Chickens are put into cages
3. Maize is used for healthy chickens
4. After 4-8 weeks chickens can be slaughtered

Temperature
30° 37° C

Australian designed
dairy farms

LIVESTOCK FARMING IN PAKISTAN:

a.k.a Pastoral Farming

Governments
Military

Commercial

- Rearing animals is one of the oldest and most common occupations in Pakistan.
- Shamilat** are the grazing fields of the villages.
- Farmers who own bullocks, cattle, buffaloes, or sheep are considered as respectable people.

Importance:

- Food - milk and meat
- G.D.P upto 10%
- raw materials
- employment
- Used as draught power

There are two types of farming, subsistence farming and commercial farming.
There are three types of subsistence livestock farming.

(i) Nomadic:

- Nomadic people in Baluchistan and the desert areas of Punjab and Sindh practice subsistence farming
- They move from place to place along with their animals in search of food and water.
- They rear sheep, goats, and camels.
- Sheep and goats provide them with food in the form of milk and meat and camels carry their loads for long distances.

(ii) Transhumance:

- Transhumance is the system of livestock farming in which the animals are kept on pastures high up in the mountains in summer and brought down to lower pastures in winter.
- This system is common in the northern and the western mountains.
- Meat, dairy products and wool are the main outputs.

(iii) Settled:

- Subsistence livestock farming is also practiced in the villages of Punjab and Sindh.
- Cows and hens are kept for milk and eggs to be continued by the family.
- Excess milk is processed to make butter or ghee.

Subsistence livestock farming as a system:

INPUTS:

- Natural grazing fields for fodder
- Water from ponds and lakes
- Open land
- Labor women and children of the family.

PROCESS:

- Natural breeding
- Feeding
- Milking manually
- Slaughtering
- Shearing wool from sheep.

OUTPUTS:

- Milk
- Meat
- Wool
- eggs

LIVESTOCK FARMING ON A COMMERCIAL FARM:

- Commercial Livestock Farming is practiced either on a small scale by private owners or on a large scale by government owned or military farms.
- Scientific methods are not necessarily to be used.
- Such dairy farms often lacking appropriate drainage or water supplies and a land use incompatible with modern hygienic city life.
- Fodder has to be brought on from the nearest crop growing area, often by heavily overloaded Lorries.
- Cattle dung is collected and dried in circular cakes plastered on any convenient wall and sold to the market to be used as manure or domestic fuel.
- There are some notable exceptions such as Australian designed dairy farms for Islamabad and Karachi, the Govt. dairy farm for Quetta etc.
- To boost livestock production scientific breeding methods and better nutritional diets are in use on many of the government farms.
- Veterinary facilities are also being provided.

Problems of Livestock:

- Few hospitals
- High prices of dairy products
- Lack of grazing fields
- Unhygienic conditions
- Inefficient marketing system of milk
- Illegal smuggling from India to Afghanistan
- Lack of processing facilities-storage facilities
- Lack of transportation



Main Livestock Resources:

(i) Cattle

- Bullock
- Cow
- Camels
- Mules

(ii) Buffaloes

- Nili bar
- Kundi
- Ravi

(iii) Sheep and goats:

(iv) Poultry

- Chicken (egg)

Factors affecting farming:

(i) Natural (physical)

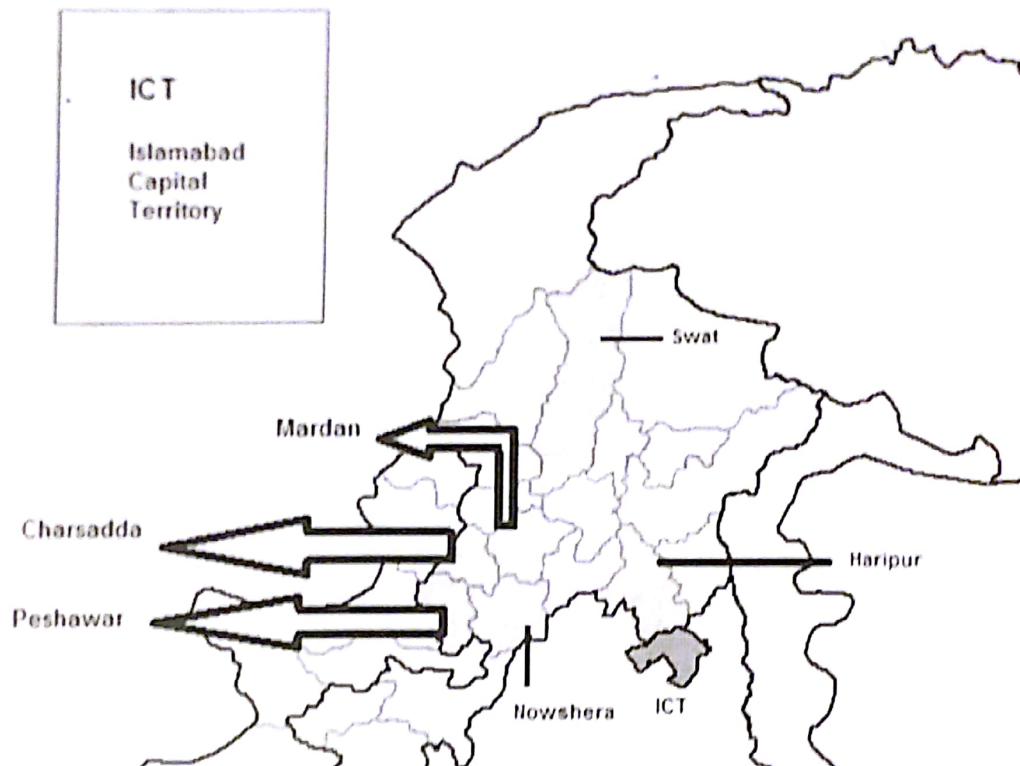
- Topography
- Soil
- Water including rainfall
- Temperature
- Pests and diseases.

(ii) Human (economic)

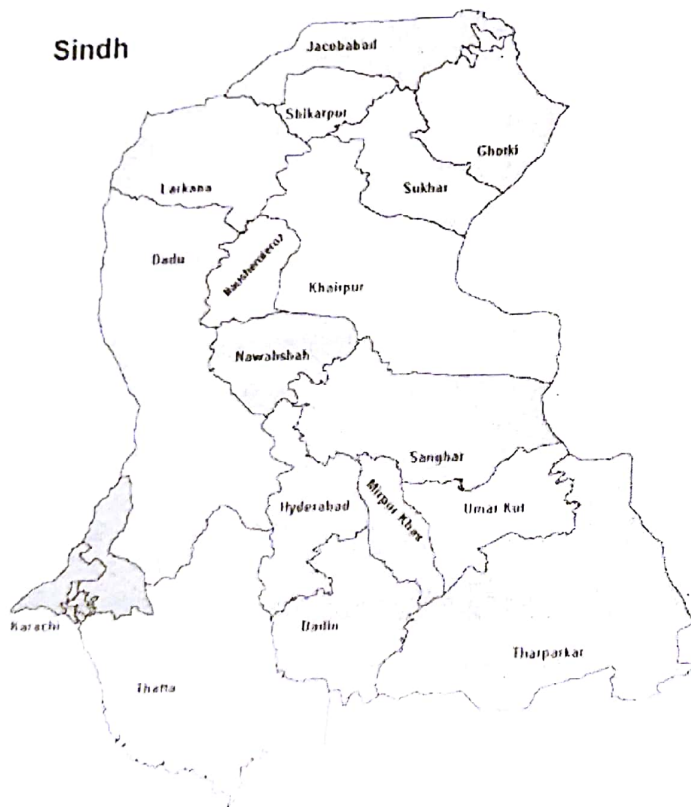
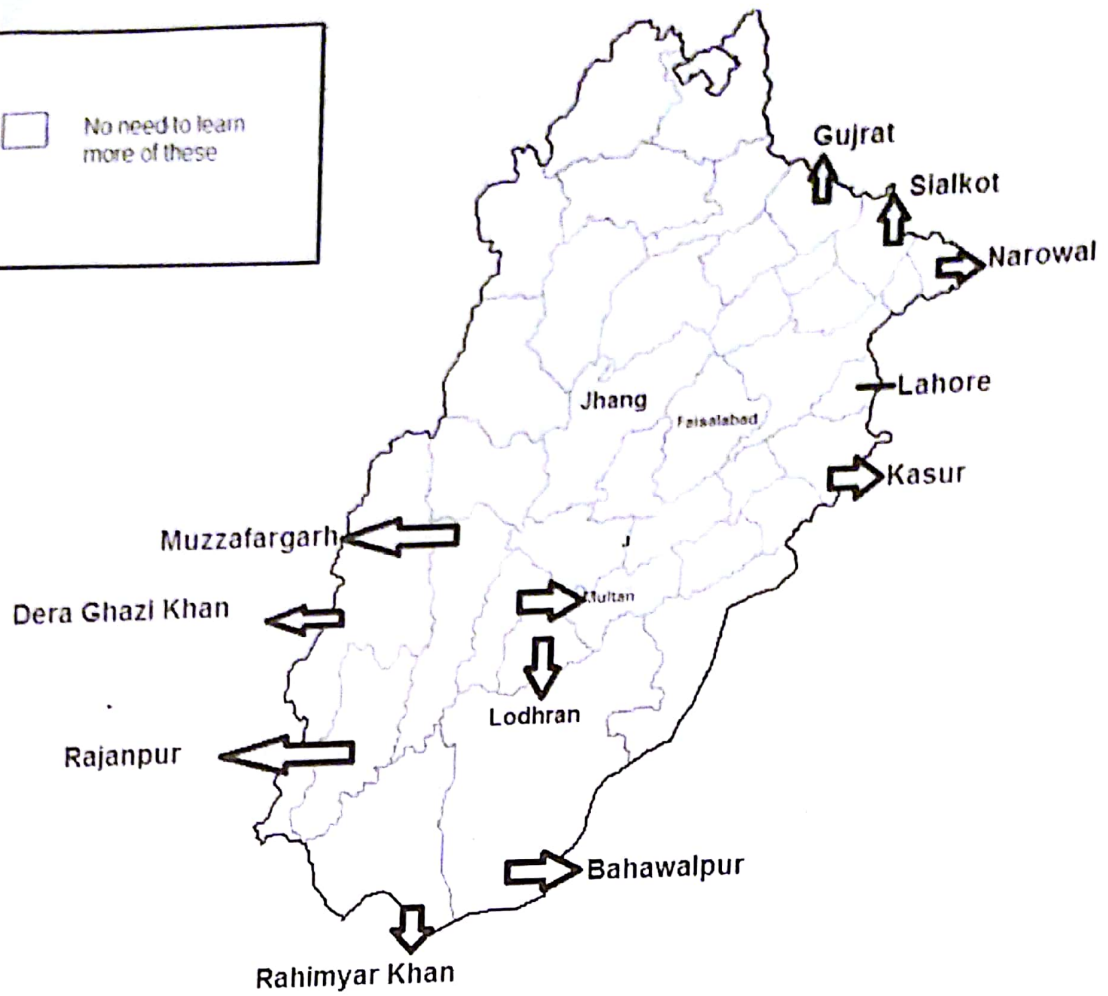
- Irrigation
- Marketing
- Size of farm
- High yielding varieties
- Mechanization
- Fertilizers
- Plant protection programmes

How the use of chemicals affect the environment:

- Farmer adds a nitrate fertilizer to increase crop yields. it is expensive to buy.
- Pesticides also drain into river water and cause pollution.
- Nitrates in rivers encourage growth of algae and large plants. They use up oxygen.
- Fish die out due to lack of oxygen.
- Water used for domestic supply affects human health.

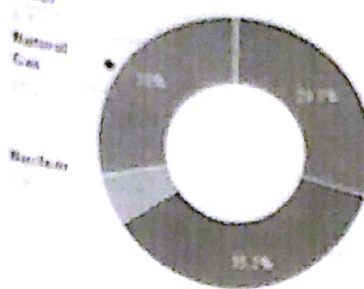


☐ No need to learn more of these



UNIT 8 POWER RESOURCES:

Pakistan's Electricity Generation by Source



Question
Formation: Coal } non-renewable
Extraction: Oil }
Extraction: Natural Gas }
Utilization: Nuclear }
Utilization: Solar } renewable
Utilization: Wind }
Utilization: Biogas }
Utilization: Geothermal }
Utilization: Wave }

Pakistan, despite the enormous potential of its energy resources, remains energy deficient and has to rely heavily on imports to satisfy hardly its needs. Moreover a very large part of the rural areas does not have the electrification facilities because they are either too remote and/or too expensive to connect to the national grid.

Pakistan obtains its energy requirements from a variety of traditional and commercial sources. Share of various primary energy sources in energy supply mix remained during last few years. There is no prospect for Pakistan to reach self sufficiency in hydrocarbons, the good option is the exploitation and utilization of the huge coal reserves of Thar and the other renewable energy sources. Pakistan has wide spectrum of high potential renewable energy sources, conventional and as well non-conventional, which have not been adequately explored, exploited and developed. Thus, the primary energy supplies today are not enough to meet even the present demand. So, Pakistan, like other developing countries of the region, is facing a serious challenge of energy deficit. The development of the renewable energy sources can play an important role in meeting this challenge.

KEY POINTS:

Non renewable energy resources:

(1) Coal:

- Coal is a very old fossil fuels
- The better types of coal have been taken several hundred million years to form
- Coal is formed by the decomposition of natural vegetation; *humus due to heat and pressure*
- There are different types of coal.
- In Pakistan bituminous to lignite types are found in limited quantity.

Types of coal:

(a) Anthracite:

- Best quality coal
- Hardest with the highest hydrocarbon content

Characteristics

Q: Identify the type of coal in the picture

- Burns quietly with great heat
- It is the blackest coal of all.
- It is formed in thin layers very deep underground.

(b) Bituminous

- Steam coal
- Coking coal
- A superior black, hard coal found in highly compressed seams.
- Burns with great heat.
- Its hydrocarbon content is less than that of anthracite.
- Coking coal is burnt to produce coke.
- It is also used in blast furnaces for the extraction of iron from the iron ore.
- It is often formed between lignite and anthracite

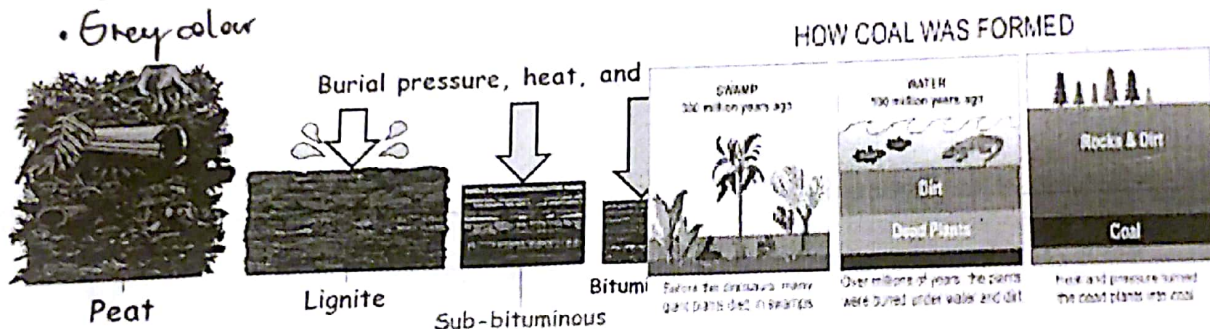
(c) Lignite

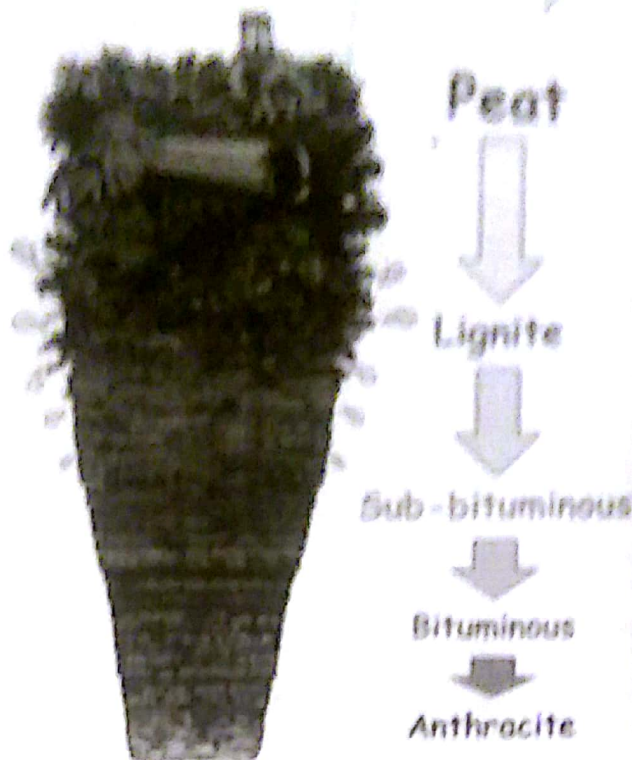
- It is found near the surface and it is easier to mine.
- It is lower quality coal with a high moisture and ash content.
- It has low heating value.

(d) Peat

- Exclusively vegetative matter and represents the initial stage of coal formation.
- Its carbon content is low.

• Grey colour





Transportation of coal from the coal mine to the end user:

- After the extraction of coal from the coal face, it is loaded onto trolleys, which run on a track, which leads from the coalmine to the outside surface.
- In some small coalmines donkeys are used as an underground transport.
- Once the coal comes out of the mine, the qualities of coal are separated and sold to the middleman who further loads it into trucks and supplies it to the brick kilns and cement factories where it is used as a fuel.
- When the coal is supplied to thermal power stations, rail transport is also used if it is economically feasible.
- **Brick kilns** use 83 % of Pakistan's coal production.

Coal as a preferred source of power in near future:

- Cannot only*
- Till the late 1990s coal was considered as the least popular energy fuel due to its poor quality and dangerous mining conditions.
 - Recently government has been considering the use of coal in the industrial sector and for power generation due to the following factors.
 - (i) New reserves of coal have been discovered in recent years. It is estimated that Pakistan has 7508 million tones of proven coal reserves in 8 major fields in lower Sindh and the salt range.
 - (ii) In view of the uncertainty surrounding the price of oil and the tremendous amount of foreign exchange involved in the import of

Usage
Brick making 60%
Power 30%
Other 10%

oil, the authorities have considered the option of the use of indigenous coal as an alternate source of fuel.
• Other alternatives could be exhausted soon.

(2) MINERAL OIL (petroleum)



- Most important fossil fuel today
- Also known as "black gold".
- It occurs in porous spaces of sedimentary rocks and is derived mainly from the decomposition of marine animal and vegetation matter over several million years.
- It can be found many hundreds of meters underground or under the sea bed.
- It mainly occurs in dome shaped anticlines between two layers of non porous rocks.
- The oil is trapped in the anticline with gas above and water below.

Oil prospecting and Drilling:

- Wells are drilled to pump this liquid fuel out of the ground.
- Once the drilling site has been selected, a derrick or drilling rig is set up.
- The derrick is a large steel structure that holds the drilling pipes and other equipment.
- Nodding machine

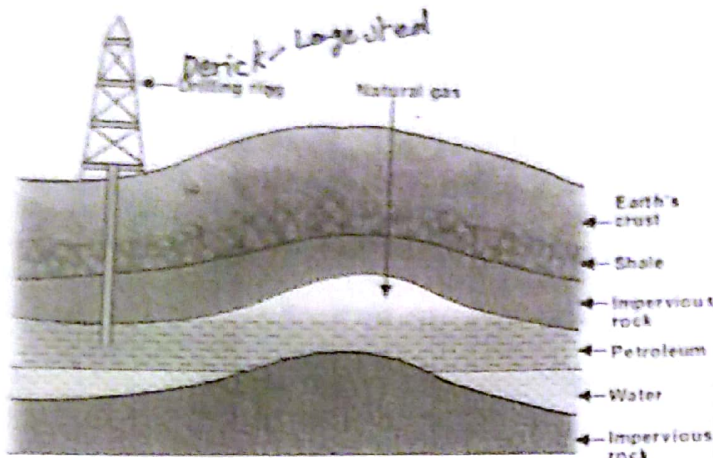


Diagram to show the occurrence of petroleum under the surface of earth.



Oil refining:

- Crude oil cannot be used in its raw state.
- It has to be processed and refined into useful products such as petrol; for cars, aero planes, heating oil, kerosene, diesel oil for truck and buses.
- It is cheaper to import crude oil and refine it locally for domestic and industrial use than to import refined products.
- Crude oil production accounted for 36.15 % and import oil accounted for 63.85 %.
- Refined oil production is 33.58 % whereas import of refined oil accounted 64.42%.
- A substantial proportion of Pakistan's import bill is spent on petroleum products which is a great burden on Pakistan's foreign exchange reserves.

Oil refineries:

- Pak-Arab Refinery Ltd.
- National Refinery Ltd.
- Byco Petroleum Pakistan Ltd. (Byco)
 - Pakistan Refinery Ltd. (PRL)
- Enar Petroleum Refining Facility (Enar),
 - Indus Oil Refinery Ltd
 - Attock Oil refinery

Karachi
to
north

Uses of oil:

- Uses of by - products (wax, plastics, synthetic rubber, detergents, pharmaceutical products, furnace oil)
- Source of power (thermal electricity, for heating)

- As a lubricant for machine
- As an indispensable motor fuel (petrol, diesel, air crafts, cars, buses, rail engines)

Transportation of imported and local petroleum:

(i) transport at sea:

- Pakistan's imported petroleum is transported by sea from oil producing countries (Saudi Arabia, UAE) through oil tankers.
- At keamari port or port Qasim, the oil tanker is berthed at the designated oil pier.
- The pier is a platform with an oil handling system.
- Through the pier the ship is connected to the oil handling system.
- The oil products are pumped from the oil tanker, ship to the oil marketing companies/refineries' storage tanks at keamari and korangi.

(ii) Transport on land:

On land oil is transported in 3 ways.

- (a) by pipeline
- (b) by road tanker
- (c) by rail tanker

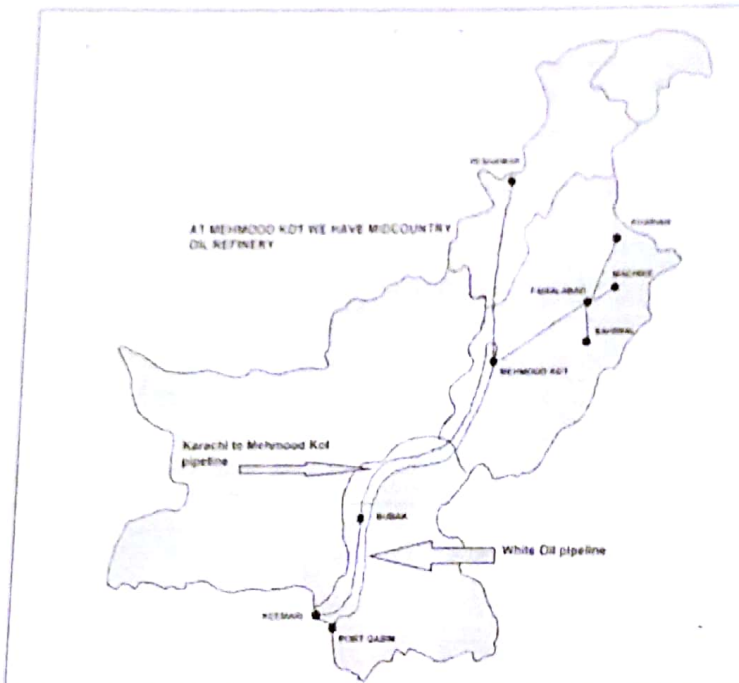
- Transportation by road and rail tankers is relatively costly, time consuming and inefficient as compared to transmission by pipelines.
- Movement of these products by roads is not only dangerous for traffic but because of their weight, it can also cause extreme degradation to the existing road surface and be a danger to human lives.
- Pipeline transportation is the most efficient, convenient and cheapest mode of transportation besides being far more environmentally friendly.

PARCO's project for the transportation of oil:

- In 2002 PARCO launched a white oil pipeline project (WOPP) which will carry refined oil from Karachi to the north.
- After conversions of PARCO's existing pipeline network for crude oil transportation, the white oil pipeline will be used for the transport of refined petroleum products to the central and northern regions of Pakistan.

- These areas account for almost 60 % of the total petroleum consumption in the country.
- Bin Qasim Port will be the initial point of the white Oil Pipeline project.
- The new underground pipeline costing \$480 million will also carry refined oil from the Pakistan oil refinery at port Qasim to Mahmood Kot in district Muzaffargarh covering a distance of 817 KM.
- The demand for petroleum products is rising at a rate of 10 % per annum.

Crude oil:
Unrefined oil



A: Once a gas well is discovered and drilling is completed gas comes out by itself because it's under high pressure of rock layers at a depth of several thousand metres. Gas is controlled by valves and little manpower is used.

(3) NATURAL GAS: C.N.G, L.P.G

- Formation
- extraction
- transportation

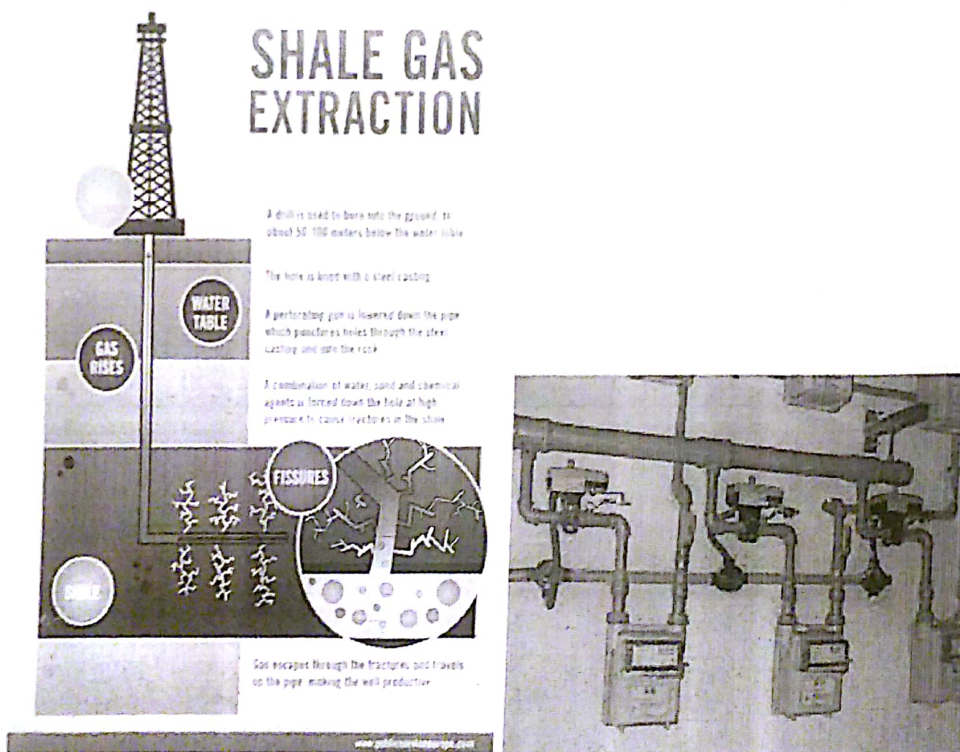
NG found in oil bearing rocks above the oil.

- These rocks have millions of tiny holes
- Above these rocks there is a layer of non-porous rocks that trap the gas underground and stop it from leaking out to the surface.

Q: Why natural gas is an easy fuel to extract?
 A: Once a gas well is discovered and drilling is completed gas comes out by itself because it's under high pressure of rock layers at a depth of several thousand metres. Gas is controlled by valves and little manpower is used.

- Natural gas is made up of many gases especially methane, ethane, propane and butanes.
- Natural gas was discovered in 1952 at Sui, Baluchistan by Pakistan petroleum limited (PPL).
- This gas field is considered to be one of the largest in the world.
- When natural gas is cooled to a very low temperature it turns into a liquid.
- This liquid is called liquefied petroleum gas of LPG.
- It can be moved from place to place in special cylinders.
- In mountainous areas where there is no gas pipelines many people use LPG for heating and cooking.

C.N.G;
Compressed natural gas.
for transportation



Organization to develop oil and gas resources:

- (i) Geological Survey of Pakistan (GSP) 1947
- (ii) Oil and gas development company limited (OGDCL) 1961
- (iii) Sui Northern Gas Pipeline Limited (SNGPL)
- (iv) Sui Southern Gas Company Limited (SSGCL) 1963

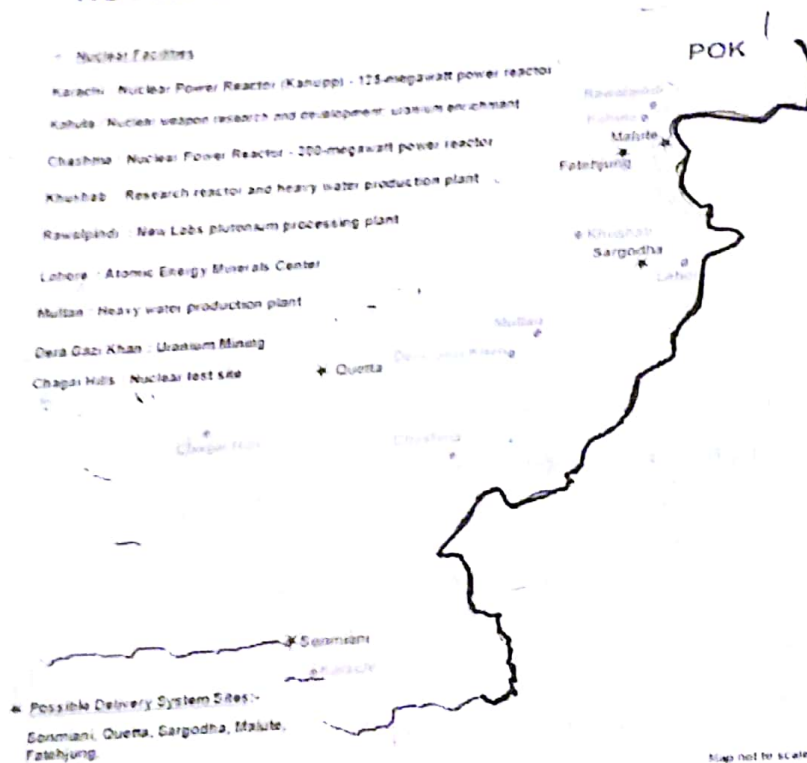
- (v) Pak Arab Refinery Co. Ltd.(PARCO) 1974
- (vi) Pakistan state oil company limited (PSO) 1976
- (vii) Hydrocarbon development institute of Pakistan 1970

Main gas fields:

- Sui, Baluchistan
- Pirkoh, Baluchistan
- Mari, Lower Sindh
- Meyal ,potwar
- Dhurnal, Potwar.

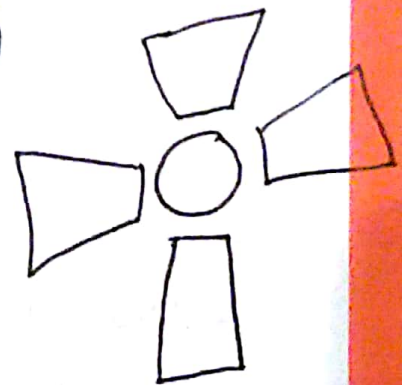
(4) NUCLEAR ENERGY:

NUCLEAR FACILITIES & DELIVERY SYSTEMS



Nuclear technology is used for;

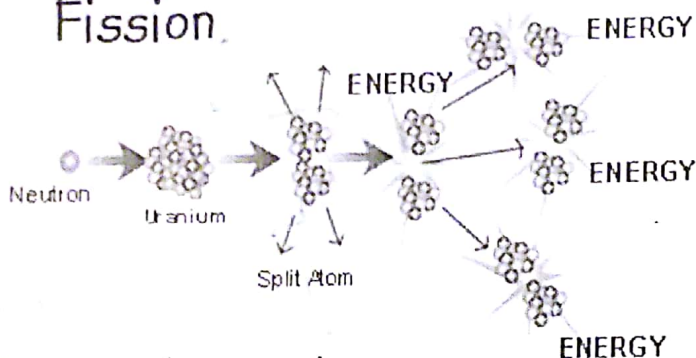
• Deterrence



- NE is power that is released from atoms.
- It is the most powerful source of energy.

- In atomic fission, energy is released when the atoms split into their constituent parts (each has a neutron, a proton, and electron)
- In atomic fusion, energy is released when atoms are fused together.
- At present nuclear power stations are based on atomic fusion.
- Pakistan is trying to utilize nuclear energy for electricity generation like other advanced countries.
- The Karachi Nuclear Power Plant was commissioned in 1971 as the first nuclear power station.
- It has an installed capacity of 137 MW.
- The second Nuclear power plant, Chashma Nuclear Power Plant was constructed under a contract between the Pakistan Atomic Energy Commission and the China National Nuclear Corporation. The plant was commissioned in 1999.

Fission



Q: Write down advantages and disadvantages of nuclear energy.

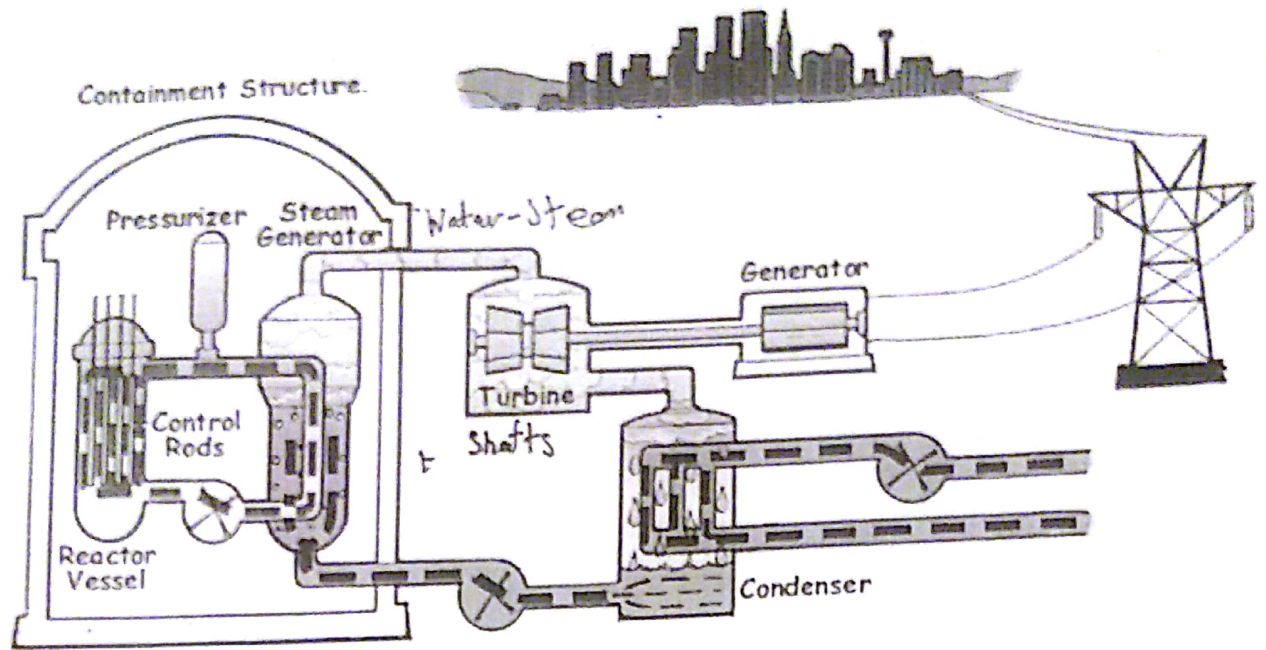
- Advantages:
- ~~Eco~~ Eco friendly
 - The chances of accidents are very rare
 - Other resources could be exhausted
 - We have technology of nuclear energy

Disadvantages:

- Nuclear waste can remain radioactive for many years
- Very expensive to build and run.
- Harmful/dangerous rays
- Other renewable resources.

Nuclear reactor!

- A device of controlled release of nuclear energy for producing heat.
- A Nuclear reactor produces and controls the release of energy from splitting the atoms of Uranium.
- Uranium fuel is a clean and efficient way of boiling water to make steam which drives turbine generators.

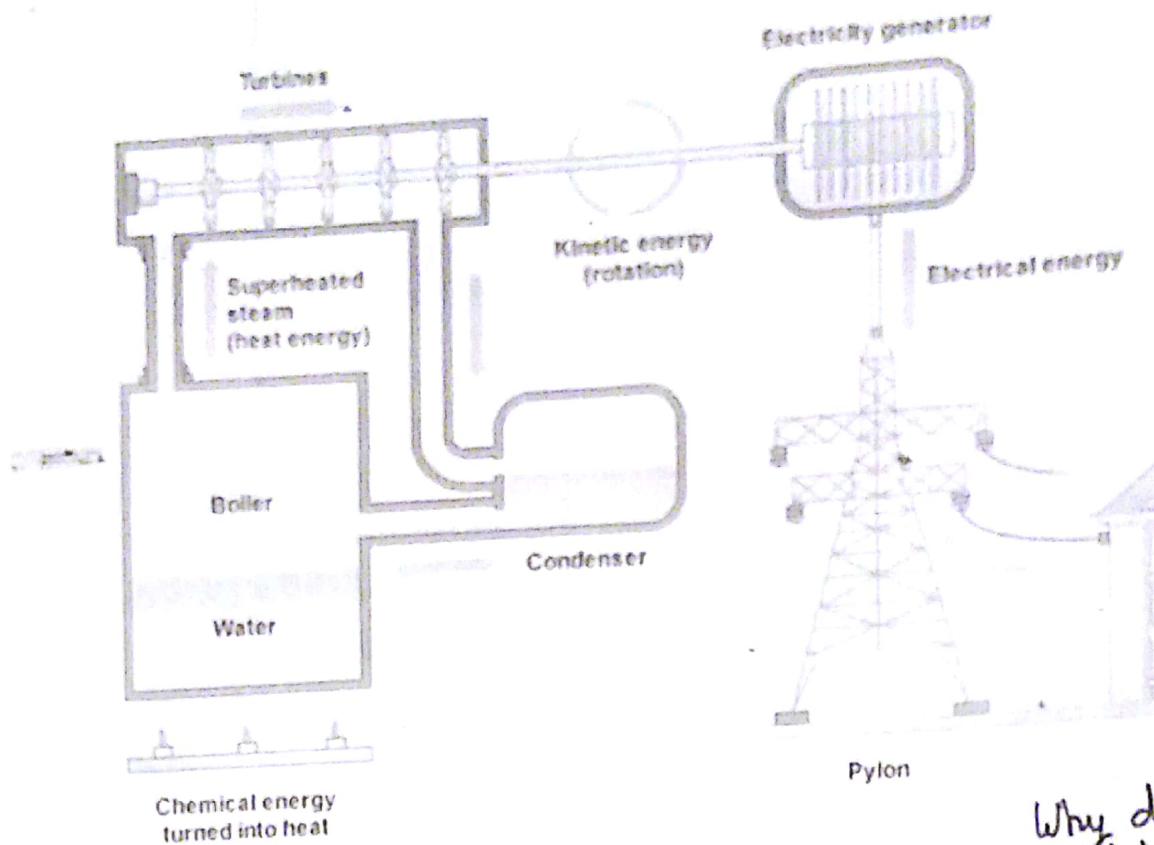


(5) THERMAL ELECTRICITY:

- Electricity is a flexible form of energy that can be easily converted to heat, light or sound energy.
- ★ Electricity that is generated by non-renewable resources like coal, gas, nuclear fuel is called "thermal electricity".
- ★ Fossil fuels and nuclear power stations produce heat energy. This is used to turn water into steam which is then used to run turbines. which are attached to generators and electricity is generated.

Q: Why electricity is not provided to rural areas?

- Very expensive/Budget/infrastructure
- less population
- Difficult to maintain
- Power theft
- Line losses: outdated lines
- Tribal opposition
- Continuous fluctuations and break downs.

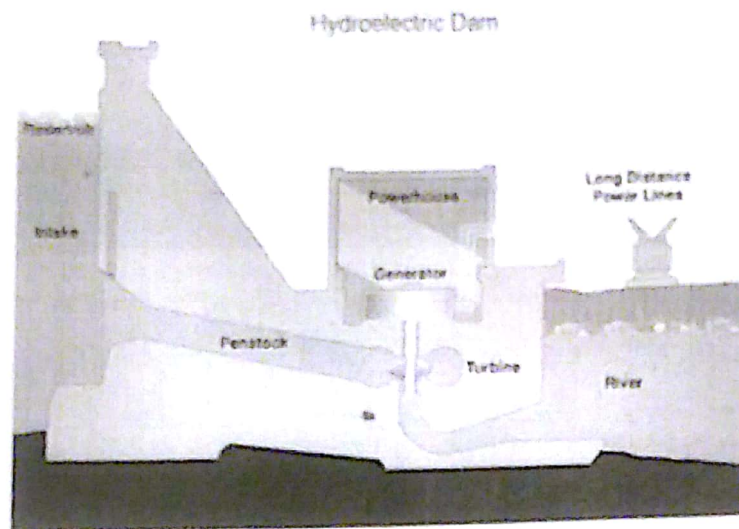


Why dams are built on highland:

Renewable energy resources:

HYDRO ELECTRIC POWER (HEP)

- ★• HEP stations use the force of flowing water to spin the hydro-turbines.
- ★• From a hydro turbine there is a shaft going into the generator.
- ★• Because the water has made the hydro turbine spin rapidly this shaft spins rapidly inside a magnetic field in the generator and this generates electricity.
- The electric current is regulated by the transformer and sent through the power line at the required voltage.
- HEP is best developed in the mountainous regions where precipitation is adequate and there is a steep slope or gradient. *Many water bodies and less evaporation. Best places for naturally built dams.*



The locations for HEP

- Kurramgari, Warsak, Dargai, Malakand, Tarbela, Mangla, Rasul, Shadiwal, Nandipur, Renalakurd, Chichokimalian

The location thermal power station:

- Daudkhel, Shahdara, Sahiwal, Multan, Quetta, Guddu, Sukkur, Kotri, Hyderabad

The location for nuclear power station:

- Chasma, Karachi

Profile of electricity generation:

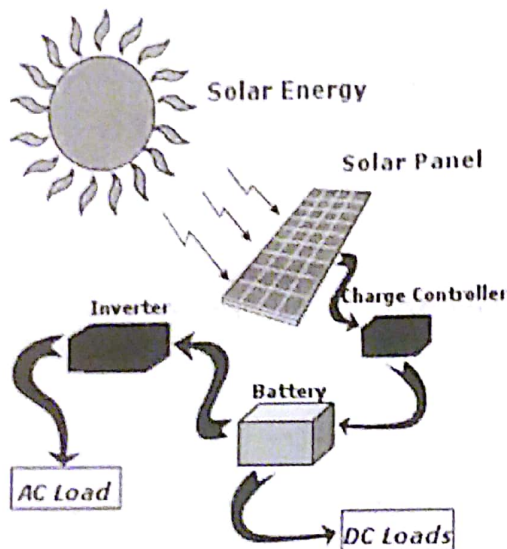
- WAPDA and KESC are the main organizations involved in power generation, transmission and distribution of electricity. *Karachi Electric Supply Company*
- The Karachi nuclear power plant (KANUPP) a public sector organization and some independent private producers (IPP) are also involved in power generation.

Installed Generation Capacity:

- HEP produces 4,825 MW (41.72%)
- Thermal produces 6,741 MW (58.28%)

SOLAR POWER

- The energy of sun light, solar power is used in several ways.
- One way is to collect it in **solar cells** (photovoltaic cells).
- Solar cells can power radios and even small cars.
- **Solar furnaces** use giant mirrors to focus the sun's rays on a boilers.
- Steam from the boiler is used to make electricity.
- **Solar panels** collect heat energy from the sun.
- Pakistan has the potential for solar energy as there are 250-300 sunny days.
- Solar power is safe, pollution free, efficient and limitless.

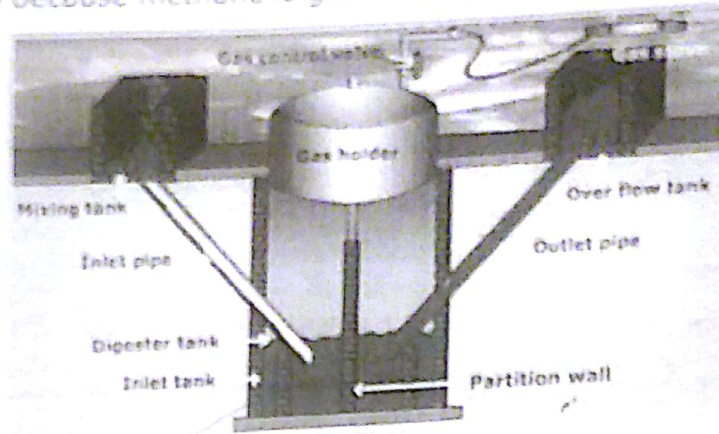


- | Adv | Disadv |
|-----------------------------------|--|
| • Potential of 250-300 sunny days | • High initial cost |
| • Environment friendly | • Useless in northern areas |
| • Limitless | • Need to have a large area - spoils beauty. |

BIO GAS:

- Bio gas is produced from animal and plant waste.
- Fermentation of cow dung gives off methane gas, which is used for cooking, heating and other purposes.
- Biogas projects are in the process of development.

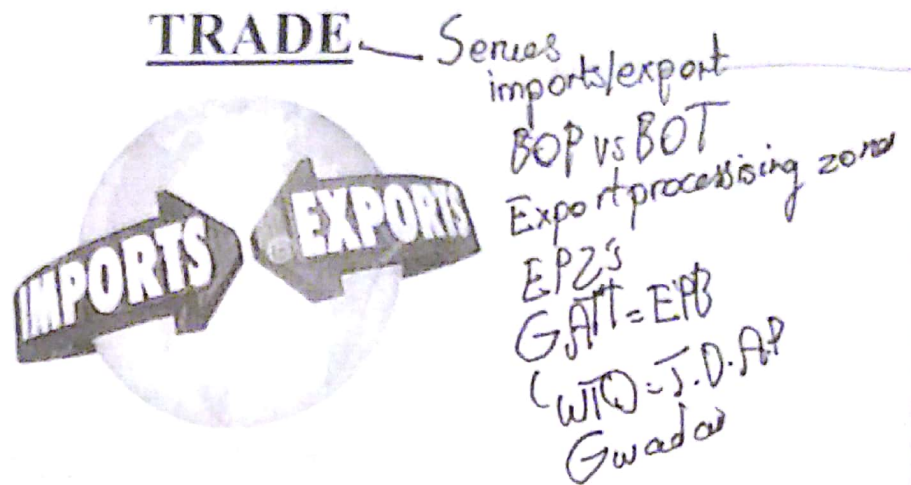
- Although bio gas is a cheap source of energy, it means cow dung can no longer be used as manure.
- If this happens on a large scale it will aggravate the deficiency of a soil already lacking in organic nutrients. Moreover it will increase air pollution because methane is greenhouse gas.



Wind turbines operate on a simple principle. The **energy** in the **wind** turns two or three propeller-like blades around a rotor. The rotor is connected to the main shaft, which spins a generator to create electricity.

Adv	Disadv
- Unlimited	- Harmful for birds
- Environment friendly	- Reliance on weather
	-

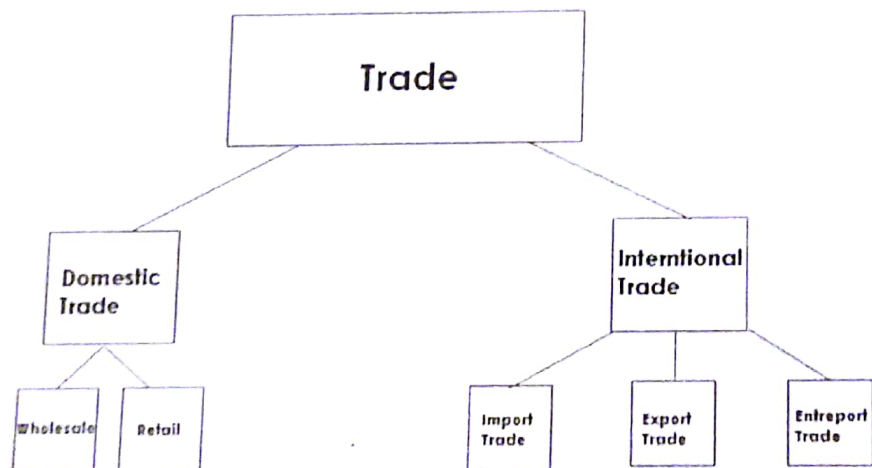
UNIT 9



What is trade?

- No country in the world is self sufficient in all the commodities needed by its people.
- To provide goods and services an exchange needs to be done.
- This exchange of goods and services between different areas is called **trade**.

8/



How do we benefit from trade?

- Specialization of production/comparative advantage
- Promotes industrialization
- May lead to rise GNP; Gross National product
- Production of value added goods; higher value than raw material

- Transfer of information technology
- Creation of employment opportunities
- Production of value added goods

Exports and Imports:

- Every country needs to trade in order to survive.
- Each year we sell millions of rupees worth of goods and services to other countries, these are **exports**.
- An export is represented by a flow of foreign exchange coming into the country.
- At the same time we also buy millions of rupees worth of goods and services from other countries, these goods are **imports**.
- An import is represented by flow of foreign exchange leaving Pakistan.

Imports of Pakistan:

- Wheat, edible oil, sugar, pulses etc.
- Machinery e.g. textile, electrical, construction, mining and agricultural.
- Petroleum and petroleum products
- Textile e.g. synthetic fibers *artificial*
- Fertilizers and other chemicals
- Metals e.g. iron and steel





*Capital goods:
The manufactured goods which are used to get further production such as machines*

*Consumer goods:
The manufactured which fulfill the daily needs of life/articles of daily use e.g. shoes, glasses, clothes, cosmetics, small machinery etc.*

Major exports:

- Cotton products 58.4 %
- Leather 6.1 %
- Synthetic textile 1.2 %
- Rice 6.9 %
- Sports goods 1.9 %
- Others 25.5 %

The following is a list of Pakistan's main trading partners as of 2015.

Country	Percentage of imports	Percentage of exports	Percentage of total trade
 <u>China</u>	19.7	11.1	16.9
 <u>European Union</u>	10.4	18.2	13.0
 <u>United Arab Emirates</u>	12.1	8.5	10.9
 <u>Saudi Arabia</u>	12.2	8.5	9.0

Country	Percentage of imports	Percentage of exports	Percentage of total trade
United States	3.2	13.6	6.7
Kuwait	6.3	0.07	4.4
India	3.7	2.1	3.2
Malaysia	3.9	0.9	2.9
Japan	3.6	1.6	2.9
Iran	3.4	1.8	2.9
Afghanistan	0.3	7.6	2.8
Singapore	4.1	0.3	2.8

The balance of payments position:

- Balance of payments = value of exports – value of imports
- Pakistan has always had a negative balance of payment because the value of its imports exceeds that of its exports.

Measures to correct the negative balance of payments:

- By increasing exports / Value added products
- By restricting imports
- By curtailing imports related to the tertiary sector

Difference b/w
 Balance of payment → goods + services
 V
 Balance of trade; balance of trade
 ↑
 Goods is the difference b/w the value of export and imports of goods only but the BOP also includes the service sector. He above definition

Q: Reason for negative balance of payment in

A: Import of capital goods
 • Our goods can't compete in a highly competitive world market
 • Lack of efficient quality control
 • Our society is a consumption-oriented one. Most goods can be made in

Export processing zones: specific areas

- Export processing zones contain industrial units which manufacture the products with export potential.
- EPZ authority, Pakistan was established in 1980 with the mandate to plan, develop and operate Export Processing Zones in Pakistan.

1) Karachi Export Processing Zone (KEPZ)

Location of KEPZ:

Karachi Export Processing Zone is located adjacent to the Landhi Industrial Area (Extension) within a distance of 18 Kilometers from the modern Quaid-e-Azam International Airport, 20 Kilometers from Port Qasim and 35 Kilometers from the highly modernized and developed Karachi Seaport. The Zone is linked with the National Highway network. It offers effective and convenient approach to the markets of the Middle East, Far East, Africa,

• Effect of rise in oil prices
 • Major export are under the threat of weather.
 • Trade barriers to
 • due to child labour.
 • It is not a member of any important trade organization.

Europe, and American to the new markets of Central Asian Republics.

2) Gwadar Export Processing Zone

An area of 1000 acres has been allocated for Gwadar EPZ.

3) Sialkot Export Processing Zone
(Managed by Punjab Small Industries Corporation)

Diversified products located in the Province of Punjab

4) Risalpur Export Processing Zone
(Managed by KPK Development Authority)

Diversified products located in KPK Province

5) Gujranwala Export Processing Zone
(Infrastructure being developed)

Diversified products located in the Province of Punjab

6) Saindak Export Processing Zone
(Operated by Chinese company)

For exploration of Gold and Copper in Chagai, District, Balochistan

7) Reko Diq Export Processing Zone
(Operated by Australian Company)

For exploration of Gold and Copper in Chagai, District, Balochistan

8) Duddar Export Processing Zone
(Operated by Chinese Company)

For exploration of Lead and Zinc in Chagai, District, Balochistan

9) Tuwairqi Export Processing Zone
(Operated by Saudi Company)

For exploration of Steel Billets located in Port Qasim Area, Karachi

Infrastructure required for the EPZs:

- EPZs should be established near the seaport to facilitate export and import of goods and the import of the required machinery.
- Consistent Government policies help to bring stability in the investment climate of a country thus attracting more local and foreign investors.
- Adequate air travel facilities should be available.
- Adequate transport facilities for the marketing of finished goods. *infrastructure*
- Efficient transport links to raw material sources.

Security protection

Sufficient electricity

Geography Handouts prepared by USMAN HAMEED 03224557967

Page 4

Strategic geographical situation of Gwadar:

- Gwadar's location between Karachi and UAE on the one hand, and on the door step of the central Asian States (CAS) on the other, could be suitable for EPZs due to a number of factors.
 - (i) Foreign investment along with Hi Tech for EPZs could be attracted to Gwader and Omara being port cities with access and exposure to the CAS.
 - (ii) The port of Gwadar can serve as "regional trade hub" with the recent geo political developments in the region such as rehabilitation and development of Afghanistan and the CAS.
 - (iii) The deep water port and export processing zone can be developed simultaneously.

I.M.F:

Functions of Export Promotion Bureau:

Trade development authority



International monetary fund and other such organizations like World Bank

- EPB was formed by the government of Pakistan for organizing and regulating export activities. its functions includes:
 - (i) Creating awareness among the manufacturing service sector about potential exports.
 - (ii) Exploring and identifying market opportunities abroad.
 - (iii) Assisting Pakistan's entrepreneurs to secure entries in the international market.

World trade organization:

help in loans which prevent a country from running out of cash over short period of time. Although these must be repaid.

- WTO is an international institution to allow free trade between its members countries by reducing or abolishing certain restrictions imposed by the governments of these countries on their exports and imports.
- It came into being in 1995.
- It is the successor to the General Agreement on Tariffs and Trade (GATT) established in the wake of the 2nd world war in January 1948 to boost trade liberalization.
- After joining the WTO, Pakistan's accessibility into international markets would be on the basis of its competitiveness.

Advantages of WTO.

Zero tariff

- Free trade cuts the cost of living
- It gives consumers more choice, & a broader range of qualities to choose from.
- Trade raises incomes;
- Trade stimulates economic growth, & that can be good news for employment
- The basic principles make the system economically more efficient, & they cut costs.
- The system allows disputes to be handled constructively.
- A system based on rules rather than power makes life easier for all; competition

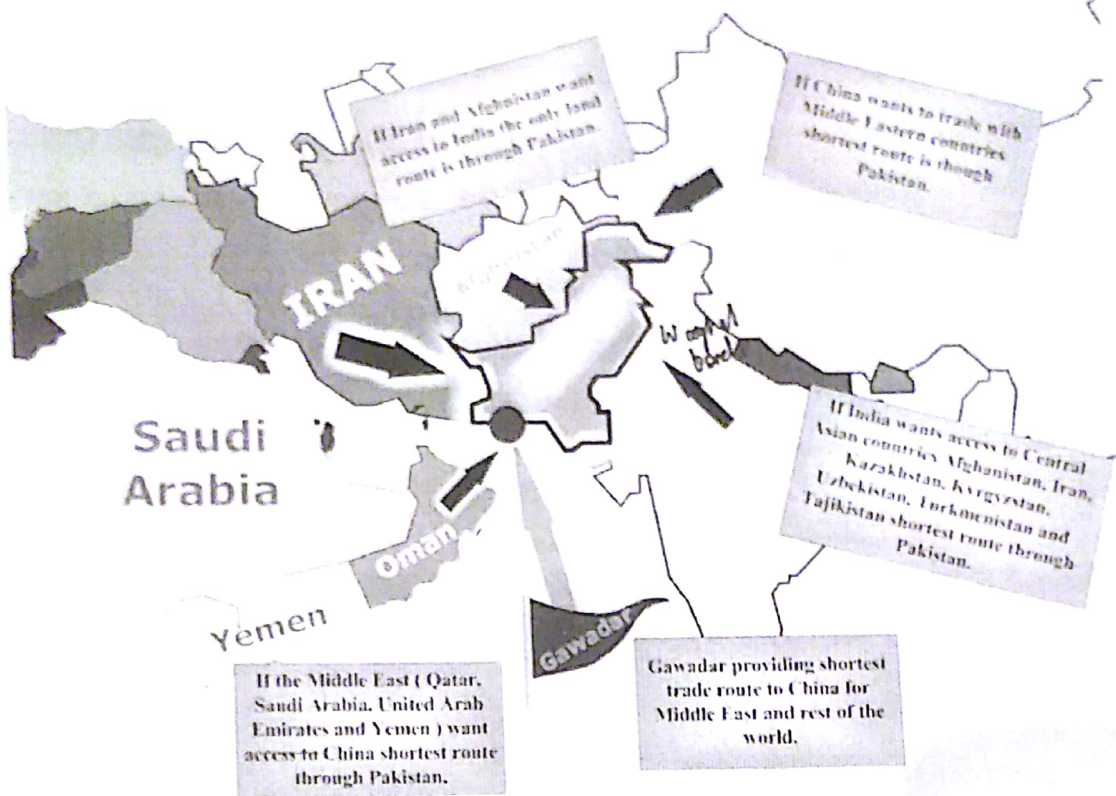
Disadvantage of WTO

- *The WTO dictates policy*
- *The WTO is for free trade at any cost*
- *The WTO destroys jobs, worsens poverty*
- *Small countries are powerless in the WTO*
- *Weaker countries are forced to join the WTO*
- *The WTO is the tool of powerful lobbies*
- *Non-tariff barriers*
- *Competition*

Trade development Authority of Pakistan:

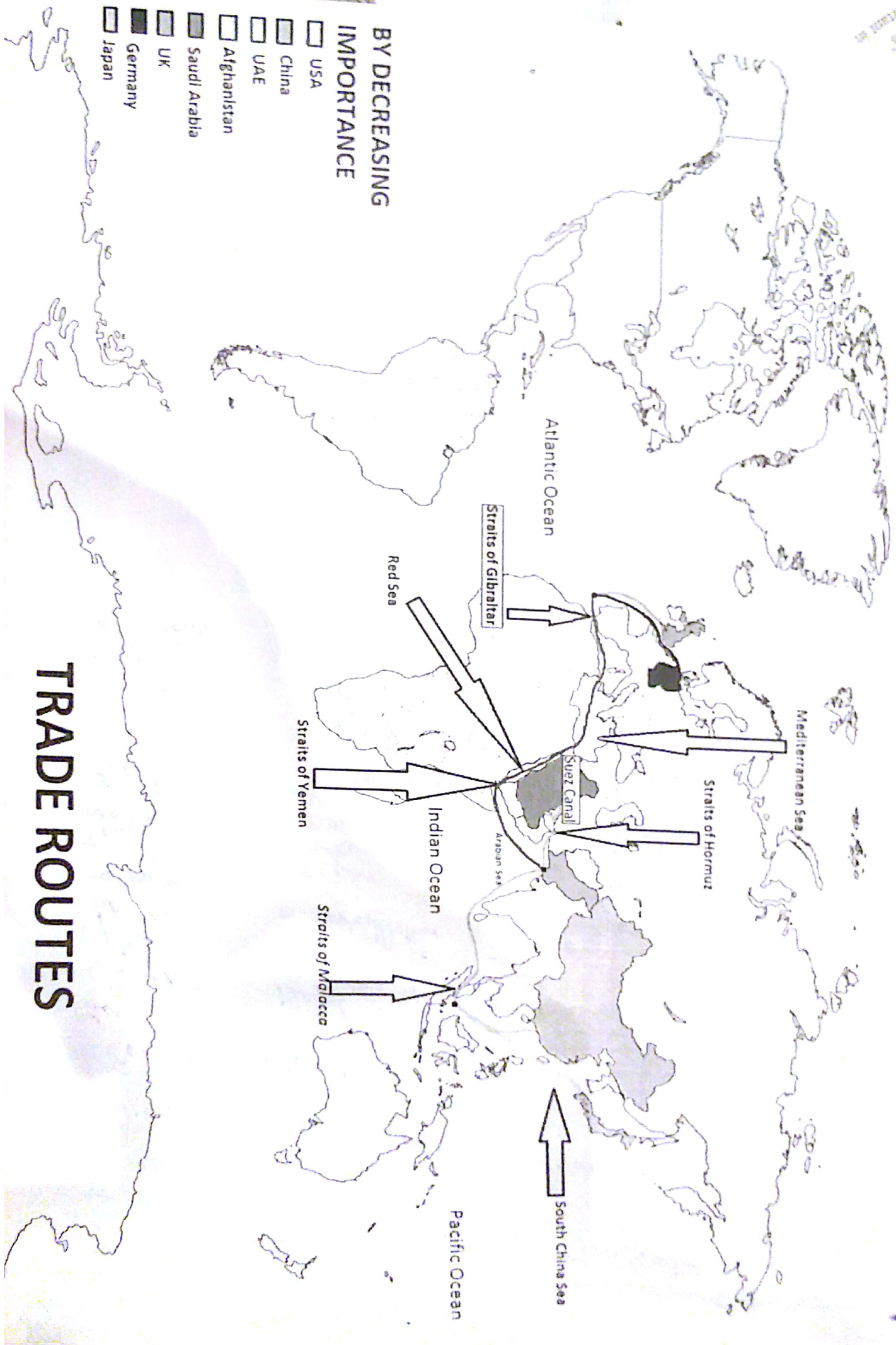
- TDAP has formally replaced the export promotion bureau which has been responsible for the export promotion for Pakistan for the last 43 years.
- TDAP will be under the administrative control of the ministry of commerce in order to ensure that the TDAP's policies are in line with the overall policies of the federal government.

AB



the importance of
the importance of

- BY DECREASING IMPORTANCE**
- ☐ USA
 - ☐ China
 - ☐ UAE
 - ☐ Afghanistan
 - ☐ Saudi Arabia
 - ☐ UK
 - ☐ Germany
 - ☐ Japan



TRADE ROUTES

UNIT 10

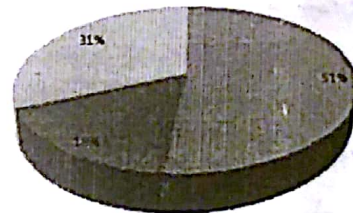
related
with production

SECONDARY AND TERTIARY INDUSTRIES:

Pakistan ranks as number 43-44 among the countries of the world in GDP, and number 55 in the world in factory output. Pakistan's industrial sector accounts for about 24% of GDP. Cotton textile production and apparel manufacturing are Pakistan's largest industries, accounting for about 66% of the merchandise exports and almost 40% of the employed labor force. Cotton and cotton-based products account for 61% of export earnings of Pakistan. Other major industries include cement, fertilizer, sugar, steel, tobacco, chemicals, machinery and food processing. The government is privatizing large-scale units, and the public sector accounts for a shrinking proportion of industrial output, while growth in overall industrial output (including the private sector) has accelerated.

Types of Industries in Pakistan

- Agriculture
 - 17,518,204 labor force employed
 - Manufacturing
 - 6,005,487 workers
 - Service
 - 10,586,309 working
- Statistics as of year 2011



Secondary Industries:

- SI is concerned with changing raw material from the primary sector or secondary products, to form a semi- finished or finished product.
- It is regarded as a system with **inputs**, **process** (smelting, weaving, spinning, dyeing, printing, knitting, molding) and **outputs** (cement, cotton yarn, ghee, lime, sugar, wheat flour, soft drinks, packets often, tinned fruit, bottles, cotton cloth, nuts and bolts, steel sheets, wire, electric motors, wheel hubs, drugs, fans, garments, motor cycles, factories, office blocks, hospitals and school etc).

- The inputs can be grouped into:
 - (i) **Capital:** the finance to establish and manage the factories.
 - (ii) **Enterprise:** business skills needed to develop ideas for products to manufacture and market them in a successful way.
 - (iii) **Land:** the actual place where the industry is located.
 - (iv) **Raw material:** every industry uses power. Some like smelting have high power consumption whilst others, like stitching, have much less.
 - (v) **Labor:** the number, skills and other characteristics of the work force.

Factors for industrial Location:

- **Physical:** Natural routes, Site requirements
- **Human:** raw material, access to market, capital, government policies, skilled labor, industrial linkages, power supply.

Principal factory industries in Pakistan:

(i) Cotton textile industrial:

The Textile industry in Pakistan is the largest manufacturing industry in Pakistan. It has traditionally, after agriculture, been the only industry that has generated huge employment for both skilled and unskilled labor. The textile industry continues to be the second largest employment generating sector in Pakistan. Pakistan is the 8th largest exporter of textile products in Asia. The Textile Industry is dominated by Punjab. 3% of United States imports regarding clothing and other form of textiles is covered by Pakistan. Textile exports share in total export of Pakistan has declined from 67% to 55% , as exports of other textile sectors grew. The major reason of decline of textile export of Pakistan is the Govt. unhealthy policies. Sui Northern Gas Pipelines Ltd. (SNGPL) notified the textile mills to reduce the supply of gas. The demand for textile products is growing, and if we are not able to fulfil our current orders, we will lose international buyers.

Problems for Cotton textile industry:

- Lack of investment
- Recession in international market
- Competition with cotton-producing country
- No modern machine
- Power crisis
- Lack of government support
- Financial constraints

KEY POINTS:

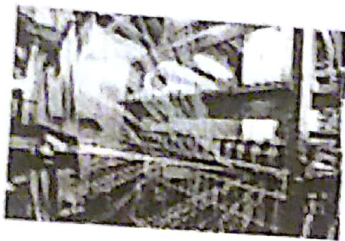
- CTI is the largest industry in Pakistan.
- It provides employment to 50 % of the industrial labor force.
- Karachi, Hyderabad and Faisalabad are the main centers of the CTI.
- Raw cotton, cotton yarn, cotton cloth, ready made garments are all exported to many countries as well as being consumed domestically

Importance of cotton textiles for Pakistan:

- The textile industry is the largest and the most important sector of the economy.
- It comprises cotton yarn, cotton fabrics and finished goods like towels, hosiery, knitwear and ready made garments.
- It possesses nearly 60 % of total export. ✓
- It contributes 7 % of the GDP.
- Multilateral relations can be improved.
- Provides 50% employment to labour force.



- Encourages infrastructure
- Generates power supply
- Training institutions



(ii) Sugar industry:

- Sugar is mainly made from sugar cane.
- Sugar mills are located in Punjab, NWFP, and Sindh. Baluchistan does not have any sugar mills.
- Sugar mills have to be located near the sugar cane fields because
 - (a) Sugar cane starts losing its sugar content as soon as it is harvested. It needs to be crushed immediately.
 - (b) Sugar cane is bulky and heavy and so it is expensive to transport.
- Uses of the by products of the sugar industry:
 - (a) **Bagasse:** can be used as fuel in sugar mills. Used to make chipboard, paper and animal feed.
 - (b) **Molasses:** used to manufacture various types of acids in the chemical industry.



(iii) Fertilizer industry:

- Chemical fertilizers have considerably increased since the green revolution in the 1960s.
- Fertilizers are very important for increasing agricultural production.
- Various raw materials e.g sulphur, phosphate, gypsum are used to make different types of fertilizers.
- Natural gas has become the main raw material.
- Faisalabad and Daud Khel in Punjab, Haripur in KPK and Dharki in Upper Sindh are the main locations.
- Nitrogenous fertilizer is most commonly used (92%) because the soils are deficient inorganic matter.
- The Pak Arab Fertilizer Factory at Multan started production in 1979.

(iv) Cement Industry:

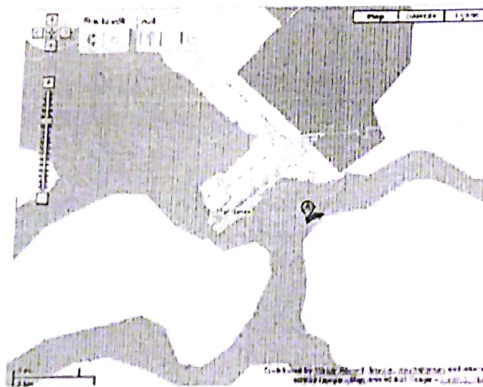
- There are many favorable factors for the development of cement industries locally.
 - (i) availability of raw material (limestone and gypsum)
 - (ii) Good domestic market with high demand from the construction industry.
 - (iii) Natural gas is used as a cheap fuel.

All Pakistan cement making association (APCMA) is the apex body of the cement manufacturers of Pakistan. It is registered body under section 3 of the Trade Organization Ordinance 2007 with license no 14, dated April 26, 2008 issued by Ministry of Commerce. It was incorporated on 14th of September 1992 under section 32 of the Companies Ordinance 1984.

(v) Steel Industry:

- The establishment of steel industry is considered to be a milestone on the road to industrialization.
- Pakistan steel mill corporation with technical and financial assistance from USSR was established on December 30, 1973 at Pipri (40km east Karachi on Ghara creek near port Qasim)
- Pakistan steel provides raw materials to the engineering and construction industries.
- These industries depend on Pakistan steel's products (coke, pig iron/hot metal, rolled and cast billets, galvanized products and raw steel) and by products as inputs.

PORT QASIM (PIPRI)

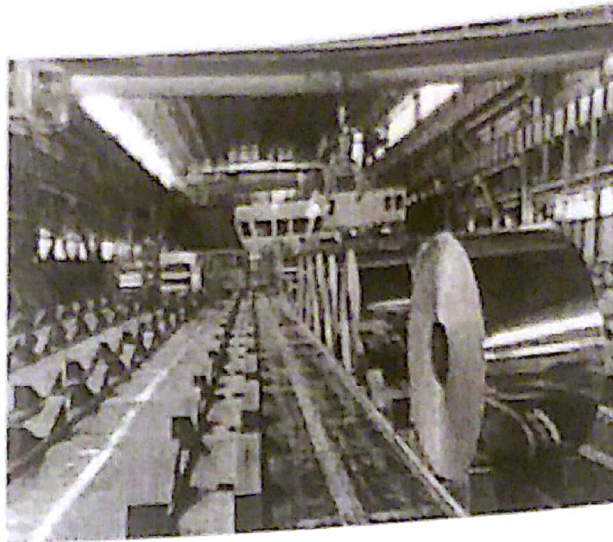


Karachi
Steel
mill

N.W of the Punjab

- The Heavy Mechanical Complex Ltd (HMC) was established at Taxila in 1979 with Chinese assistance.
- HMC is helpful in manufacturing of industrial plants and machinery.
- The Heavy Forge Factory (HFF) at this complex has also provided crucial for Pakistan's defense production needs.
- HMC is also manufacturing equipment for hydro electric power plants, thermal power plants, oil and gas processing plants and chemical plants.

- Boilers, cranes, construction machinery, material handling equipment, steel structures and railway equipment are some of the other products besides sugar mill machinery



Difference
b/w small scale
and cotton
industries

Small scale

- 10 to 50 workers can be hired
- Investment cost maximum 10 million
- Mechanized
- 10 million investment
- Urban areas

Industrialization and the private sector in the early years:

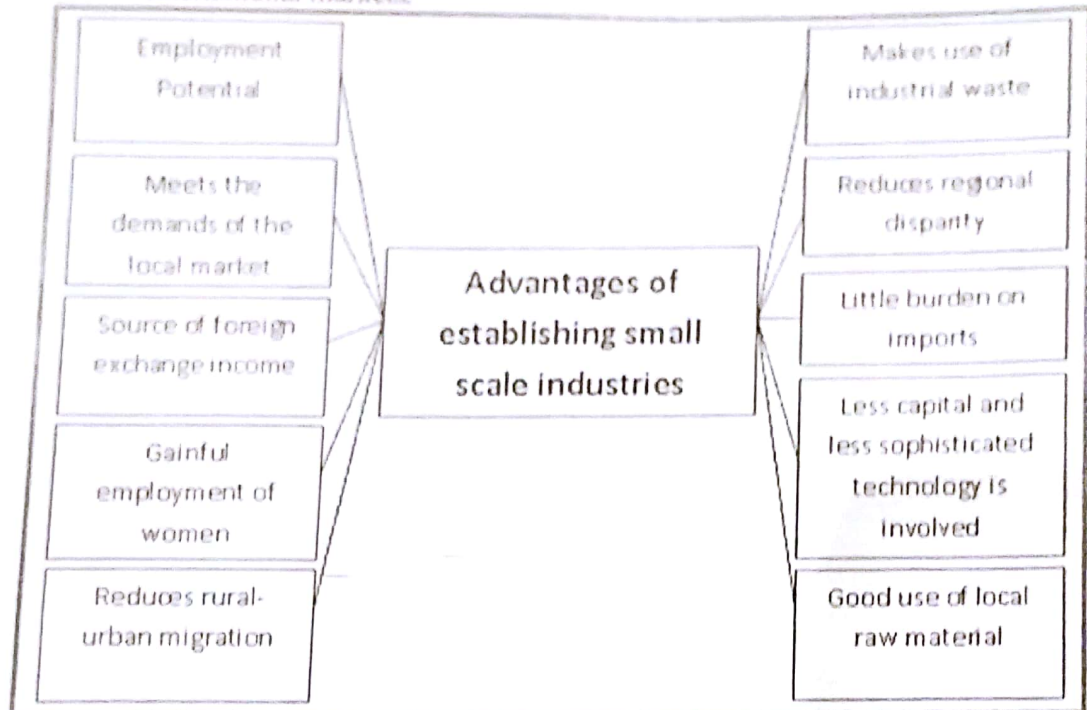
- After 1947 the private sector was reluctant to invest in capital intensive industries.
- The Pakistan Industrial Development Corporation (PIDC) established to invest in industries (fertilizers, textiles, cement, chemicals, sugar, paperboard) in which the private sector was reluctant.
- Later PIDC transferred some of their projects to the private sector when the risk was reduced.
- This encouraged the private sector and stimulated industrial activity during the 1960s.
- During 60s, the country became self sufficient in most of the agro-based industries. This period is known as the Era of Industrialization".

Cottage
Small scale
Manufacturing
is completely
partially
carried
on in the
homes of workers
No hired labor
is employed
Mostly set up
in rural
areas
Investment is
not more
than
1 lac - 2 lac

Cottage / Craft small – scale industries in Pakistan:

- Cottage or household industries hold an important position in the rural set up.
- Most villages are self sufficient in the basic necessities of life.
- They have their own carpenters, blacksmiths, potters, craftsmen and cotton weavers.
- Many families depend on cottage industries for their income.
- CI has also gained immense importance in cities and towns.

- There is great demand for hand woven carpets, embroidered work, brassware, rugs and traditional bangles.
- These are also considered important export items and are in good demand in international markets.



bis
 - Less demand
 - Image problem
 - Low quality products
 - pollution: water/air
 - Life hazardous
 - Deforestation
 - Illegal

Types
 - Sports Goods
 - Sargical
 - Brick Kilns



Khaddi
 hand made
 clothes

cottage
small scale



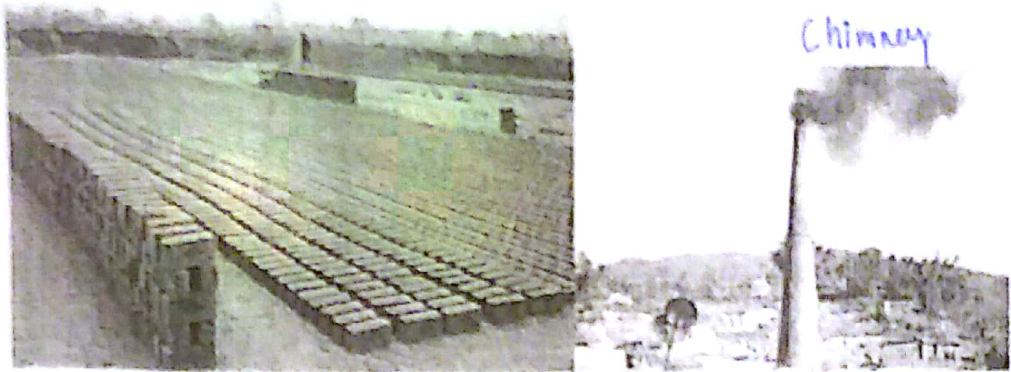
ceramics



pottery



Small
scale



Q: Brick making

Government policy towards small scale and cottage industries:

- Pakistan's small scale corporation
- Punjab small industries corporation
- Sindh small industries corporations
- The small industries development board KPK
- The directorate of small industries Baluchistan

How does industrial pollution affect people?

- Serious health hazardous in the form of various diseases
- Containment of sub soil water affects food crop and supplies of drinking water from wells
- Dumping of industrial waste causes land pollution
- Industrial wastewater is harmful for the irrigation of crops including food crops
- Threat to marine life
- Threat to mangroves –reduction in fish production
- Seaport pollution due to nearby industries
- Creating noise pollution

no product /
rapidly growing

TERTIARY INDUSTRY:

- TI is concerned with providing a service and is sometime known as a service industry.
- It can be divided into a number of different groups such as public administration, transport, defense and tourism.

Tourism:

- Tourism means the whole business of providing accommodations and recreation facilities for those people who are traveling and visiting or staying in a place for a relatively limited period of time.
- The purpose for the visit or stay is primarily for pleasure.
- Recently tourism has the world's fastest growing industry.
- It has become an important factor in the economy of most developed countries as one of the possible ways to obtain income and create jobs.

- In Pakistan domestic and foreign tourism is small scale at present.
- Except for a small group of dedicated mountaineers, mainly foreigners, very few people visit Pakistan.

International visitors to Pakistan:

- There are three main groups
 - (a) visitors on business
 - (b) people visiting families
 - (c) tourists

The natural attractions of Pakistan:

- Northern areas
- Kaghan valley
- Swat valley
- Gilgit valley
- Skardu
- Hunza valley
- Chitral

Cultural attractions in Pakistan;

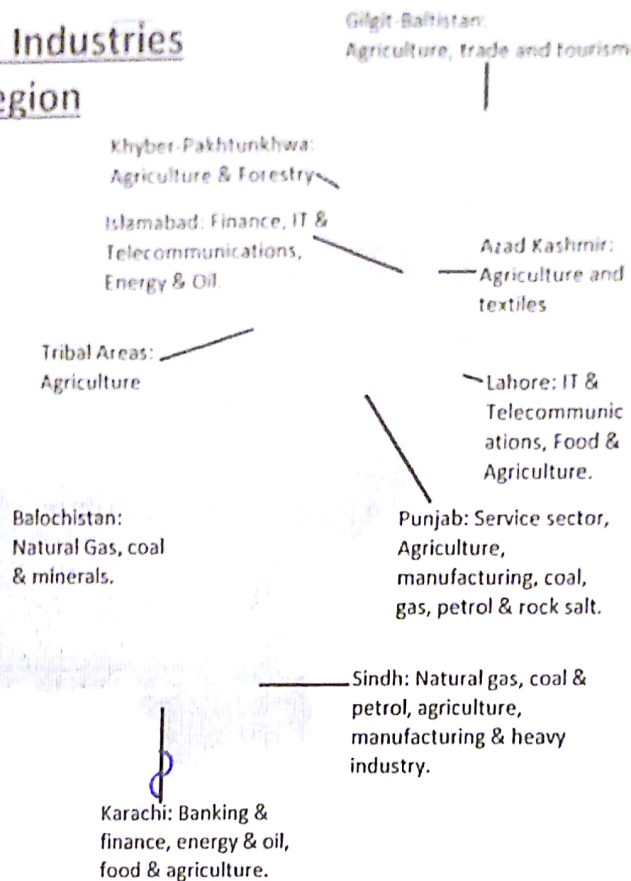
- Archaeological sites (moen-jo-daro, harappa, taxila)
- Historic sites (Khyber pass, badshahi mosque, muhabat khan in Peshawar, Shalimar gardens Lahore, allama iqbal's tomb)
- Modern buildings (faisal mosque, parliament building and presidential palace mausoleum of quaid, minaret pakistandams and barrages)
- Salt mines
- Traditional bazaars

Main Industries

Gilgit-Baltistan:

- Traditional bazaars

Main Industries by Region



Factors required for tourism

- Presence of tourist attractions
- Security/Protection
- Infrastructure
- Marketing and Publicity
- Transport and communication
- Government priorities - P.T.D.C

Adv and Dis of tourism

- Employment
- Development of infrastructure
- Cottage industry
- Reduces migration
- Production of food is increased

Dis

- Provides seasonal employment
- Can destroy local culture
- Prices of necessities rises
- Deforestation

UNIT 11

TRANSPORT AND COMMUNICATION

- The development of transport system provides a sound base for the socio economic growth of a country.
- With a growing population and expansion in agriculture and industry, the demand for efficient transport has increased over the years.
- There are four major means of transport in Pakistan

- Rail
- Road
- Air
- Water

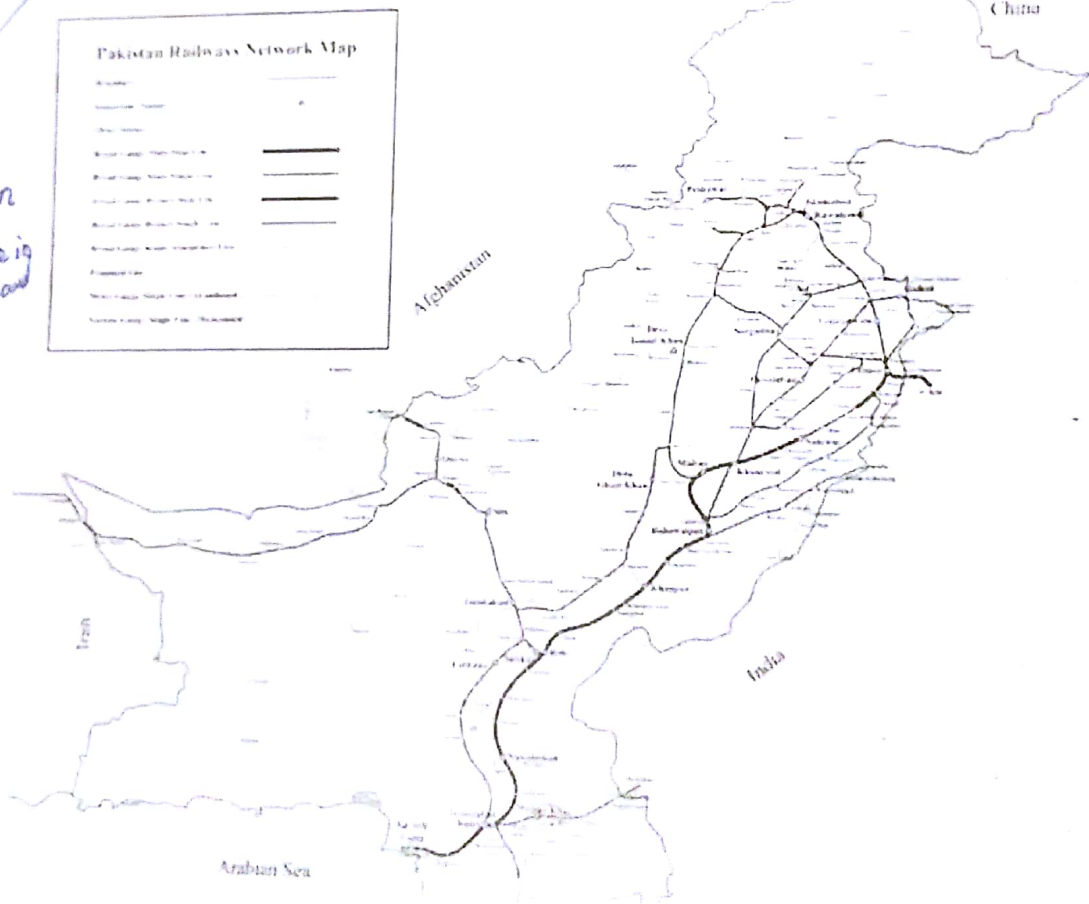
No dual track systems

Pakistan railways:

- The network of PR extends to 11899 km of track with about 900 stations & 54 train halts; *place where train stops/halts*
- It stretches from Karachi to Peshawar & from Peshawar to Dargai.
- A branch of railway extends its way from Sukkur to Sibi & on to Quetta.
- From Quetta one branch terminates at Chaman and the other goes to Zahidan in Iran.
- There is a dense railway network in Punjab and Sindh. *but not in KPK and Baluchistan*

*1947
8550 km
railway
track
extended
to
11,899 km*

- Difficult terrain
- Climate
- Population
- Agriculture is the Punjab and Sindh
- Industries



Gauge system of PR:

- PR has a multi gauge system.
- (i) broad gauge (5 feet 3 inches wide)
- (ii) metre gauge (3 feet 3 inches wide)
- (iii) narrow gauge (2 feet 6 inches)

Causes for PR deterioration:

- lack of investment
- worn out rails & sleepers
- operational inefficiencies — never on time
- overstaffing & corruption
- uneconomic stations
- a poor reservation system
- absence of dual line
- 65 % rails, 55 % sleepers, 60 % diesel locomotives and 100 % steam & electric locomotive are outdated.
- Track increased from 8570 km to 8775 km from 1960 to 2000.



Developments in PR:

- Replacement of steam engines with diesel engine
- Introduction of faster trains from Karachi to Lahore (Shalimar express)
- Electric traction on 289 m from Lahore to Khanewal. } closed & out of functional
- Establishment of repair workshop (Moghalpura)
- Construction of Karachi Circular Railway 1969-1990
- Construction of railway track to Gwadar.
- Computerized ticketing system 2007
- Orange line Train

Karakorum express:

- Major development by PR was the launching of a new Chinese made train in 2002.
- 200 S financed by Exim bank, met 88 % of total financial requirements.
- It has 14 coaches with 9 compartments & 6 berths, which are air conditioned.

Samjhota Express
Train b/w India and [initials]

Moghalpura Railway Workshop

The Moghalpura Railway Workshops are one of several rolling stock repair sites, located on the Lahore-Wagah Branch Line at Moghalpura Junction railway station in Lahore, Pakistan. The workshop complex began to emerge at its present site in 1904 in order to manufacture, repair and overhaul passenger coaches and freight wagons for the then North Western State Railway. After Pakistan's independence in 1947, it was the only state-of-the-art workshop for Pakistan Railways.

Classes

Pakistan Railways has several classes of travel. Depending on the route, certain trains may only have a single class. The fares for all classes are different with unreserved seating class being the cheapest. The following table lists the classes in operation.

Class	Description
AC Sleeper	Class Code = ACSL
AC Parlour	Class Code = PC
AC Business	Class Code = ACLZ
AC Standard	Class Code = ACL
First Class Sleeper	Class Code = ISL
Economy Class	Class Code = EC
Second Class	Class Code = SEC

Karachi Circular Railway

Karachi Circular Railway abbreviated as **KCR** is a proposed revival of the regional public transit system in Karachi, Sindh, which served the Karachi District region between 1969 and 1999. With its hub at Karachi City station on I.I. Chundrigar Road, KCR's revived operations will extend as far as Gadap to the north, Dhabeji to the east, Kiamari to the south and Hub to the west. Proposals to revive the KCR as an inter-regional public transit system in Karachi with aims to connect several industrial and commercial districts within the city to the outlying suburbs have been put forward.

Dry ports:

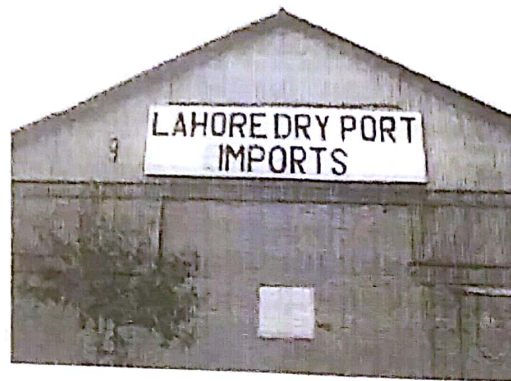
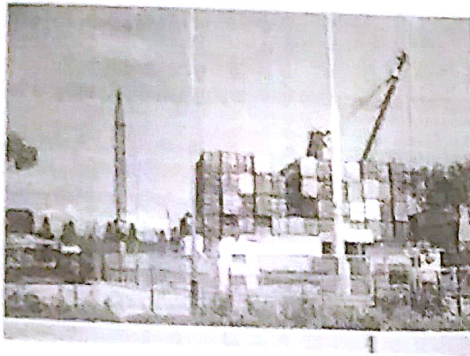
A dry port (sometimes inland port) is an inland ~~intermodal~~ terminal directly connected by road or rail to a seaport and operating as a centre for the transshipment of sea cargo to inland destinations.

Aims

Connected

In addition to their role in cargo transshipments, dry ports may also include facilities for storage and consolidation of goods, maintenance for road or rail cargo carriers and customs clearance services. The location of these facilities at a dry port relieves burden on seaports.

A dry inland port can speed the flow of cargo between ships and major land transportation networks, creating a more central distribution point. Inland ports can improve the movement of imports and exports, moving the time-consuming sorting and processing of containers inland, away from congested seaports.



- Some inland cities which are far from the seaports have established dry ports to promote foreign goods.
- It also speeds up export & import procedures.
- At present there are 9 dry ports

Following are the few dry ports running under the management of Pakistan Railways:

- | | |
|--|--|
| • <u>Lahore Dry Port</u> Established in 1973 | • <u>Rawalpindi Dry Port</u> Established in 1990 |
| • <u>Quetta Dry Port</u> Established in 1984 | |
| • <u>Peshawar Dry Port</u> Established in 1986 | • <u>Sialkot Dry Port</u> Established in 1986 |
| • <u>Multan Dry Port</u> Established in 1988 | • <u>Faisalabad Dry Port</u> Established in 1994 |

Aims of establishing dry ports:

- To reduce the workload at Karachi port & port Qasim in order to speed up the checking and clearance of cargo.
- To help govt. in the smooth collection of revenue.
- To provide hassle-free transportation of cargo from their production point to the sea port directly.
- To stimulate foreign trade activities in those cities which are far way from the sea port.

Requirements for the dry ports:

- Highly efficient rail transport with a container service to carry bulk cargo.
- Efficient managerial staff.
- Huge storage sheds & open areas.
- Refrigeration facilities for perishable items.

Problems
- Improper rail
- No managerial staff
- corruption

Roads:

Q: Why do we prefer roads
Q:

- Road transport carries 82 % of the total passenger traffic & 54 % of the total freight in the country.
- Total network is 181836 km, 118194 km are metalled & 63642 non metalled.
- Little development in KPK & Baluchistan.
- The National high way authority is responsible for the construction and maintenance of all national highways.



Principle roads of Pakistan:

(1) The N5 *Sher Shah Suri constructed the road*

• N5 stretches for 1260 km from Karachi through Lahore and Peshawar to Turkham. It changes name at Lahore.

(a) The National highway:

- 1 The N5 is called the national highway from Karachi to Lahore
- 2 It passes through Hyderabad, Sukkur, Bahawalpur and Multan.

*Cause many
accidents*

(b) the Grand trunk road:

- 1 From Lahore to Peshawar the N5 is called GTR.
- 2 Built by Sher Shah Suri. Linking Kabul, Peshawar, Rawalpindi, Lahore, Delhi and Bengal.
- 3 Its total network is 181836 km.

(2) The Indus Highway:

The **Indus Highway**, also known by its technical designation **N-55**, is a 1,264 km long four-lane highway that runs along the Indus River in Pakistan connecting the port city of Karachi with the north western city of Peshawar via D.G.Khan. It is part of Pakistan's National Highways network and is maintained and operated by Pakistan's National Highway Authority. The Indus Highway passes through the Kohat Tunnel.

In 1980, the Indus Highway was proposed to provide an alternative and shorter route to the heavily used N-5 and to also aid the development of western Sindh province and eastern Khyber Pakhtunkhwa province. Construction began in 1981 from Karachi and was completed in 1985 in Peshawar.

(3) the RCD highway:

- connects Karachi to Quetta over 600 km away
- After passing through Lasbela, Khuzdar, Quetta, Nushki and Nok Khundi in Pakistan, it then leads to Iran & Turkey.

(4) Lahore – Quetta

(5) Sukkur-Quetta

(6) Karakoram Highway

The **Karakoram Highway (KKH)** is the highest paved international road in the world. It connects China and Pakistan across the Karakoram mountain range, through the Khunjerab Pass, at an elevation of 4,693 metres (15,397 ft). It connects China's Xinjiang region with Pakistan's Gilgit-Baltistan and Khyber Pakhtunkhwa regions and serves as a popular tourist attraction. Due to its high elevation and the difficult conditions in which it was constructed, it is sometimes referred to as the "Eighth Wonder of the World."

(7) **Makran Coastal Highway** is a 653 km-long coastal highway along Pakistan's Arabian Sea coastline. It is a part of Pakistan's National Highways network. It runs primarily through Balochistan province between Karachi and Gwadar, passing near the port towns of Ormara and Pasni. The official and technical designation of the Makran Coastal Highway is **N10**, which is the abbreviation for **National Highway 10**.

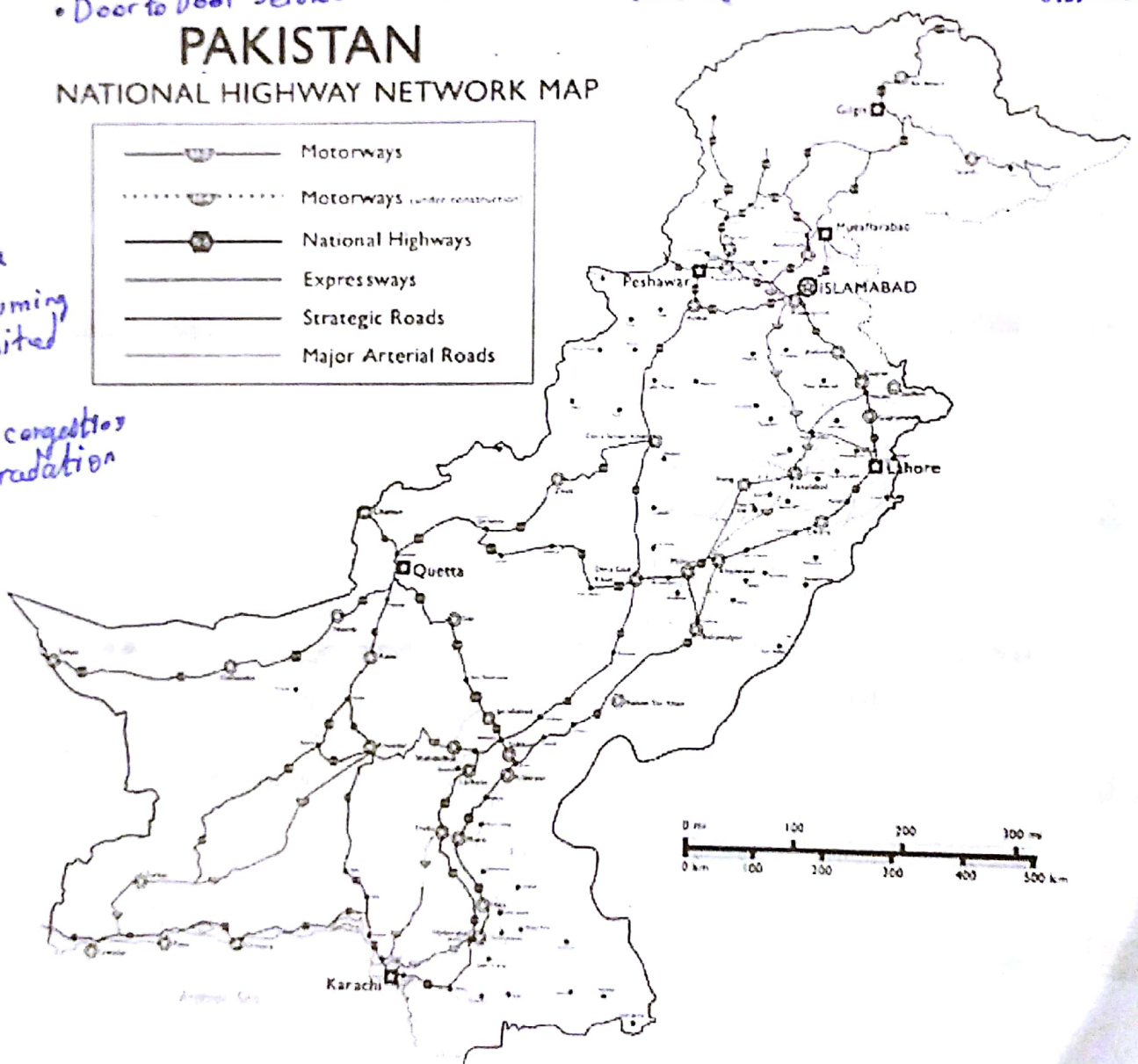
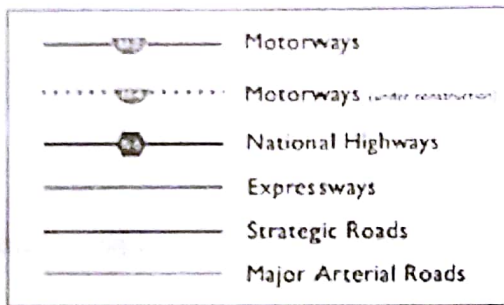
(8) The Motorways of Pakistan are a network of multiple-lane, high-speed, limited-access or controlled-access highways in Pakistan, which are owned, maintained and operated federally by Pakistan's National Highway Authority.

Why Need Motorways:

- Quicker and faster mode of transport
- Industrial estates to be established close to highway
- Promote industrial growth
- Employment opportunities
- The motorways can be connected to Afghanistan and central Asian States to provide all year round sea access to landlocked countries.

- Roads
- Easy to build
 - Low investment
 - Door to Door Service
 - Better Network
 - All type of vehicles can be used
 - Preferable for short distances
- Railways
- Cheaper
 - Takes less time
 - More efficient
 - Carry more goods
 - Long distances












PAKISTAN NATIONAL HIGHWAY NETWORK MAP



Problems (Road)

- Expensive
- Time consuming
- Carry limited goods
- Traffic congestions
- Road degradation

List of motorways

Motorways						
Name & Sign	Course	Length	Lanes	Completion Year	Status	Remarks
 M-1	Peshawar - Islamabad	155 km	6	2007	Operational	
 M-2	Islamabad - Lahore	367 km	6	1997	Operational	
 M-3	Pindi Bhattian - Faisalabad	54 km	4	2003	Operational	Connects the M-2 Motorway (near Pindi Bhattian) to Faisalabad and the M-4 Motorway
 M-4	Faisalabad - Multan	233 km	4	2014	Under Construction	Under construction since 2009. Faisalabad-Gojra section scheduled for completion in march 2014. ^[1]
 M-5	Multan - Rajanpur	165 km	4	2017	Planned	Construction planned to commence in 2014. ^[2]
 M-6 (M-6A)	Rajanpur - Ratodero	264 km	4	2017	Planned	Designated the M-6A, construction is planned to commence in 2014. ^[3]
 M-6 (M-6B)	Ratodero - Dadu	150 km	4	2017	Planned	Designated the M-6B, construction is planned to commence in 2014. ^[4]
 M-7	Dadu - Hub - Lyari	350 km	4	2017	Planned	Construction is planned to commence in 2014. ^[5]
 M-8	Ratodero - Gwadar	892 km	4	2016	Partially Operational/Under Construction	2-lane Ratodero-Khuzdar section complete and operationalized. 2 lanes nearing completion, 2 additional lanes to be added in future. Work on Gwadar-Turbat-Hoshab section suspended for security reasons. 60-km Shahdadt - Khuzdar section 80% complete. ^[6]
 M-9	Hyderabad - Karachi	136 km	6	2017	Planned	Upgradation of existing Super Highway into 6-lane motorway. Construction scheduled to commence in 2014 and to be completed in 4 years. ^[7]
 M-10	M-9 - N-25 (Karachi Northern Bypass)	57 km	4	2009	Operational	Currently 2-lanes, to be upgraded to 4-lanes

Air Transport:



carrier and a state-owned enterprise of the Government of Pakistan.

PIA has a long history of milestones in aviation, being the first Asian airline to operate a jet aircraft and Boeing 737 aircraft; it today remains by far Pakistan's largest airline with a fleet of 33 airplanes and at least 20 more on order. It is currently going through a procedure of privatisation to shift management from government to private sector.

Pakistan International Airlines less formally known as PIA is the national flag

HISTORY:

- In 1947, Orient Airways, a small air company operated in Pakistan.
- By 1949, Pakistan Airways, Orient Airways & Crescent Airways were operating in Pakistan.
- PIA was established in 1955 to provide safe & efficient national & international airways.
- Some private airlines like Aero Asia, Shaheen & Air Blue are operating in Pakistan.

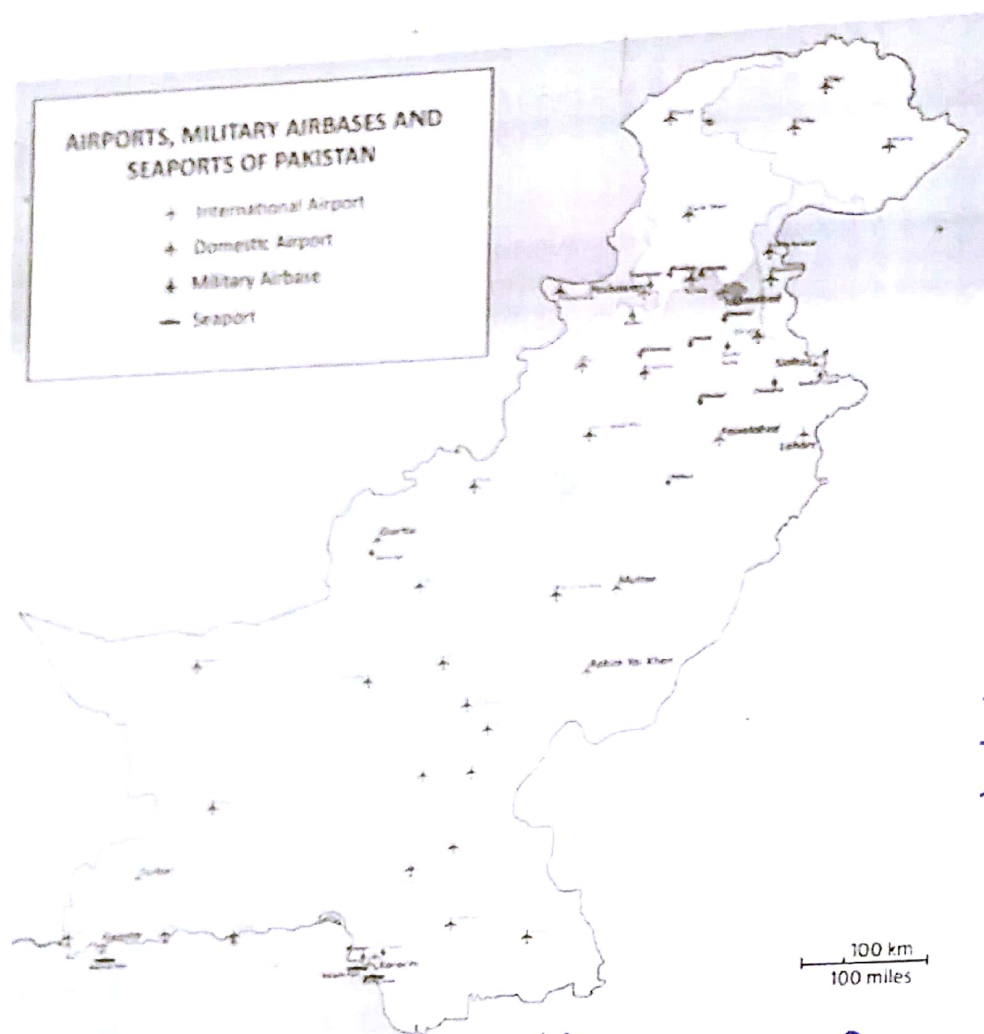
Major airports are: Government/Military

- Jinnah International Airport (Karachi)
- Allama Iqbal International Airport (Lahore)
- Benazir Bhutto International Airport (Rawalpindi)
- Peshawar International Airport - Badshah Khan airport (Peshawar)
- Quetta International Airport (Quetta)
- Faisalabad International Airport (Faisalabad)

Sambriel

- Multan International Airport (Multan)
- Sialkot International Airport (Sialkot)
- Dera Ghazi Khan International Airport (D.G.Khan)
- Gwadar International Airport (Gwadar)
- Shaikh Zayed International Airport (Rahim Yar Khan)

Civil Aviation Authority



Q: Why do have more flight bto Punjab and sindh

- International airports e.g. Lahore, Multan and Karachi
- Heavily populated areas
- Rich people belong to these areas
- More industries
- Plain areas for long runway
- More administrative blocks

Why was it developed?

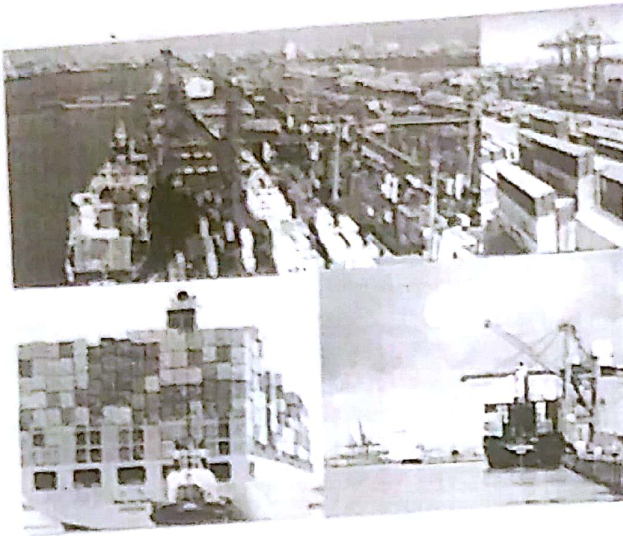
Development of Air Transport:

- Faster means of communication
- Rise in general living of standard.
- Air transport can be accessed through the mountains while roads and railways mainly operate in plains.
- Large numbers of people have now settled in Middle East, Far East, European Countries and America.
- The world has turned into a Global village due to improvement in Communication as more and more people opt for air transport.
- Karachi is an important air transit air route to and from Europe and East – Asia and vice versa.
- Frequent visits of diplomats and foreign delegations.
- Faster movement of perishable items

Requirements:

- Flat and abundant land
- Capital for lounges, parking and control tower
- Water, electricity and infrastructure
- Near to urban areas
- Trained custom and office security

Water Transport



Gulf with the Indian Ocean. On it lie the Karachi Port which has been serving this part of the erstwhile Indian subcontinent and later Pakistan on its creation in 1947. However, owing to the growing needs of the country, there was a need to develop other smaller coastal ports into major cargo handling ports. Beside Karachi, Pasni, Jiwani, Gadani, Ormara and Gwadar are other ports which are being developed into world class ship handling centres. Of these Gwadar is the latest development, which is almost completed and recently in December 2008.

Pakistan shares a 1,200 kilometres long coast line with the Arabian Sea - a mid sea which joins the strategic oil line of Persian

Q: How do we have modernized Kemari port?
• Made a deep sea port
• Dock system
• Fly over
• Extension in facilities to handle cargo
• Environment protection

- WT in Pakistan developed only for international transport as no intercity water transport is available
- Kemari port and Mohammad Bin Qasim are two important ports of Karachi.

Kemari Port:

The Port of Karachi is one of South Asia's largest and busiest deep-water seaports, handling about 60% of the nation's cargo, located in Karachi, Pakistan. It is located between the Karachi towns of Kiamari and Saddar, close to the main business district and several industrial areas. The geographic position of the port places it in close proximity to major shipping routes. The administration of the port is carried out by the Karachi Port Trust, which was established in the nineteenth century.

- It is deep sea port
- It has larger coaches
- Flyover & overhead etc. are being developed to ease out traffic problems.
- Extension in the facilities to handle cargo.
- Provision of navigational aids & radars.
- Expansion in the storage & refrigeration facilities.
- Environment protection equipment to keep sea water clean.

Port Qasim:

The Port Muhammad Bin Qasim also known as Port Qasim, is a deep-water seaport in Karachi, Sindh, Pakistan, on the coastline of the Arabian Sea. It is Pakistan's second busiest port, handling about 35% of the nation's cargo. Port Qasim and Karachi Port, the busiest port of country; together handle more than 90% of all external trade of Pakistan.

• develop industrial zones

Ease Karachi port

The port encompasses a total area of 12,000 acres (49 km²) wherein many industrial zones operate. In addition to the Pakistan Steel Mills (PSM) and KESC Bin Qasim Power Plant, around 80% of the Pakistan's automotive industry is located at Port Qasim. The port also provides direct waterfront access to two major nearby industrial areas, Export Processing Zone (Landhi) and Korangi Industrial Area. Approximately 60% of country's export and import is originated from these areas. Port Qasim is managed by Port Qasim Authority, a semi-autonomous government body.

• For development of EPZ's

Developed
• deep port
• busiest port

- by strike (if calamity strikes Karachi, the others are used)
- It is located at about 20 km South East of Karachi at the Ghara Creek.
- It is also deep sea port and was built in 1980.
- It has modern facilities to handle raw material for Pakistan steel.
- It is integrated multipurpose deep sea port and the industrial zone.
- It is spread over 12,000 acres of land.

Gwader Port:

- It is located on the Makran coast in Baluchistan.
- Gwader could be a support port for bin qasim and Kamari.
- It can provide a short way to central Asian States
- Central Asian States can open their warehouses at Gwader.
- The total area would be 2500 acres.
- The idea was initiated in 1993 but in 2001, Pakistan sign an agreement with China so that the plan could go ahead.

Future Prospects of Gwader:

- Baluchistan, being the largest province has to be provided with its own fully developed sea port.
- Support port to bin Qasim & Kamari
- It can help industries to be set up in the region.

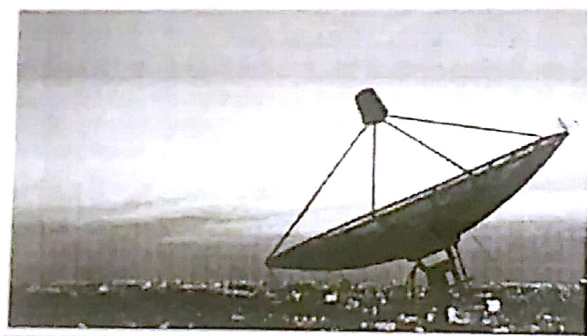
Pakistan National Shipping Corporation (PNSC)

- It was established in 1979 to develop the maritime shipping industries.
- Its objective are to serve as an operational links between major trading partners
- To maintain influence on the freight rate
- To save foreign exchange

China-Pakistan Economic Corridor

The China-Pakistan Economic Corridor is an under-construction development program to connect Gwadar Port in southern Pakistan to China's northwestern autonomous region of Xinjiang via highways, railway's and pipelines to transport oil and gas. Chinese Premier Li Keqiang was among the first advocates of the project, since then Chinese President Xi Jinping, former Pakistani President Asif Ali Zardari and Pakistan Prime Minister Nawaz Sharif have become strong supporters of the project. When the corridor is constructed it will serve as a primary gateway for trade between China and Middle East and Africa, in particular oil from the Middle East could be offloaded at Gwadar, which is located just outside the mouth of the Persian Gulf, and transported to China through the Baluchistan province in Pakistan. Such a link would vastly cut the 12 000-kilometre route that Mideast oil supplies must now take to reach Chinese ports. Pak-China Economic Corridor Secretariat was inaugurated in Islamabad on August 27, 2013.

Telecommunication is the transmission of signs, signals, messages, writings, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems. Telecommunication occurs when the exchange of information between communication participants includes the use of technology. It is transmitted either electrically over physical media, such as cables, or via radiation. The term is often used in its plural form, **telecommunications**, because it involves many different technologies.



authority;

• PEMRA • PTCL
 • P.T.A
 • P.T.U.K.T

Q: Benefits of telecommun

- Faster means of communication
- Cheap
- Portable ^{Any Virtual} university
- Online education
- Speedy access to information
- Online ordering
- Establishment of multi-national companies
- Advertisements / New market opportunities
- Online Banking

Telecommunications in Pakistan describes the overall environment for the growing mobile telecommunications, telephone, and Internet markets in Pakistan.

In 2008 Pakistan was the world's third-fastest growing telecommunications market. Pakistan's telecom infrastructure is improving dramatically with foreign and domestic investments into fixed-line and mobile networks; fibre systems are being constructed throughout the country to aid in network growth.

- Reasons for high growth
- Controlling
- Population
- Employment/Unemployment
- Migration
- Push/Pull factors
- Adv/Disadv

Unit 12 POPULATION

country's population had a relatively high growth rate that has been changed by moderate birth rates. In 2014, the population growth rate stands at 1.49%. Dramatic social changes have led to rapid urbanization and the emergence of megacities. During 1990–2003, Pakistan sustained its historical lead as the second-most urbanized nation in South Asia with city dwellers making up 36% of its population.

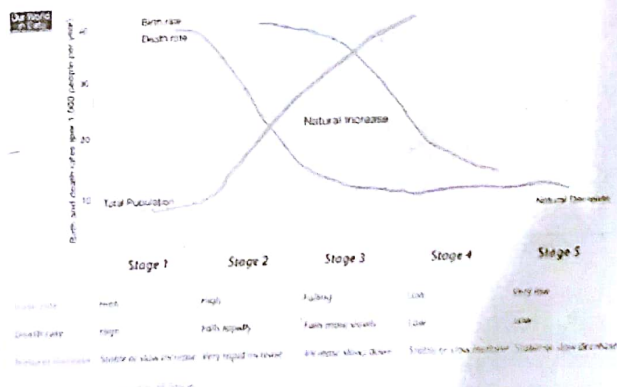
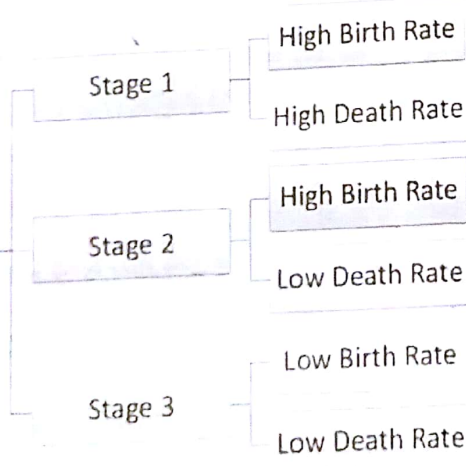
Pakistan has a multicultural and multi-ethnic society and hosts one of the largest refugee populations in the world as well. The majority of southern Pakistan's population lives along the Indus River. Karachi is the most populous city in Pakistan. In the northern half, most of the population lives about an arc formed by the cities of Faisalabad, Lahore, Rawalpindi, Sargodha, Islamabad, Multan, Gujranwala, Sialkot, Nowshera, Swabi, Mardan, and Peshawar.

208.32 million
Census 17

Pakistan's estimated population in 2016 is over 191.71 million, making it the world's sixth-most-populous country, behind Brazil and ahead of Nigeria. During 1950–2011, Pakistan's urban population expanded over sevenfold, while the total population increased by over fourfold. In the past, the

Demographic Transition Model: *Scientific study of population*

Demographic Transition Stages & Pakistan Position



Population:

- The number of people living in an area at a particular time.

Overpopulation: ✓

- When the population of a country couldn't generate its resources according to their need, this situation is called overpopulation.

Birth Rate:

- No. of babies/infant born per thousand or per hundred in one year.

Death rate:

- No. of people dying per thousand or per hundred in one year.

Growth rate: ✓

- Birth rate - death rate = *natural growth rate*

Life expectancy:

- No. of years a person is supposed to live unless killed by an unnatural way (calamity, murder & accidents etc.)

Population density: ✓

- No. of people living per square area
- $1500000000 / 796096 = 188.5$ people/km

$$\frac{\text{total people}}{\text{total area}}$$

Causes of High Population Growth rate:

- (i) Early marriages:
 - about 60 % the population lives in villages where an early marriage takes place more frequently.
- (ii) Religious Controversies:
 - Allah is undoubtedly the sole provider so the people think that he would nourish all the souls.
- (iii) opposition to contraceptives
- (iv) wish to have son
- (v) illiteracy
- (vi) refugees (afghan)
- (vii) frequent changes in government hinders population welfare programmes
- (viii) children are employed as labour force in the farms and in the cottage industry
- (ix) Larger families are preferred in villages to be employed in agricultural fields.

Solution to high population:

- 1 educating the people (career oriented/distress)
- 2 Convincing the people about use of contraceptives
- 3 Convincing the ulemas to give ^{not against Islam} fatwas about the population planning
- 4 Improving the role of NGOs and other organization. (Social Media)
- 5 Delayed marriages
- 6 Educating the women.

Immigration, moving to a country (entering)
emigration, expelled

Migration:

- The process of moving from one place to another with intent of staying at the destination, permanently or for a long period of time.
- The difference between "immigrate" and "emigrate" is that "immigrating" is the act of entering a foreign country to live while "emigrating" is the act of leaving a country to live in another
- Migration can be done by push factor or pull factor

What are reasons for out-migration?

Rural Push Factor:

- Lack of study opportunities
- Lack of job opportunities
- Social discrimination
- Less medical facilities
- Religious discrimination lawlessness
- Lack of infrastructure
- Political instability

Urban Pull Factor:

- Study opportunities
- More jobs opportunities
- More or less social equality
- More medical facilities
- Less religious discrimination
- Law is properly followed and obeyed
- More infrastructure
- Political stability

Adv and Disadv of out-migration (Rural to Urban)

- Remittances
- Population control
- Flow of I.T
- Release pressure on employment
- Cultural ties
- Image problems
- Loss of brain drain
- Lack of skilled labour
- Cultural expatriation
- Economic bubble
- Home sickness

Population structure

Population structure means the 'make up' or composition of a population. Looking at the population structure of a place shows how the population is divided up between males and females of different age groups. Population structure is usually shown using a population pyramid.

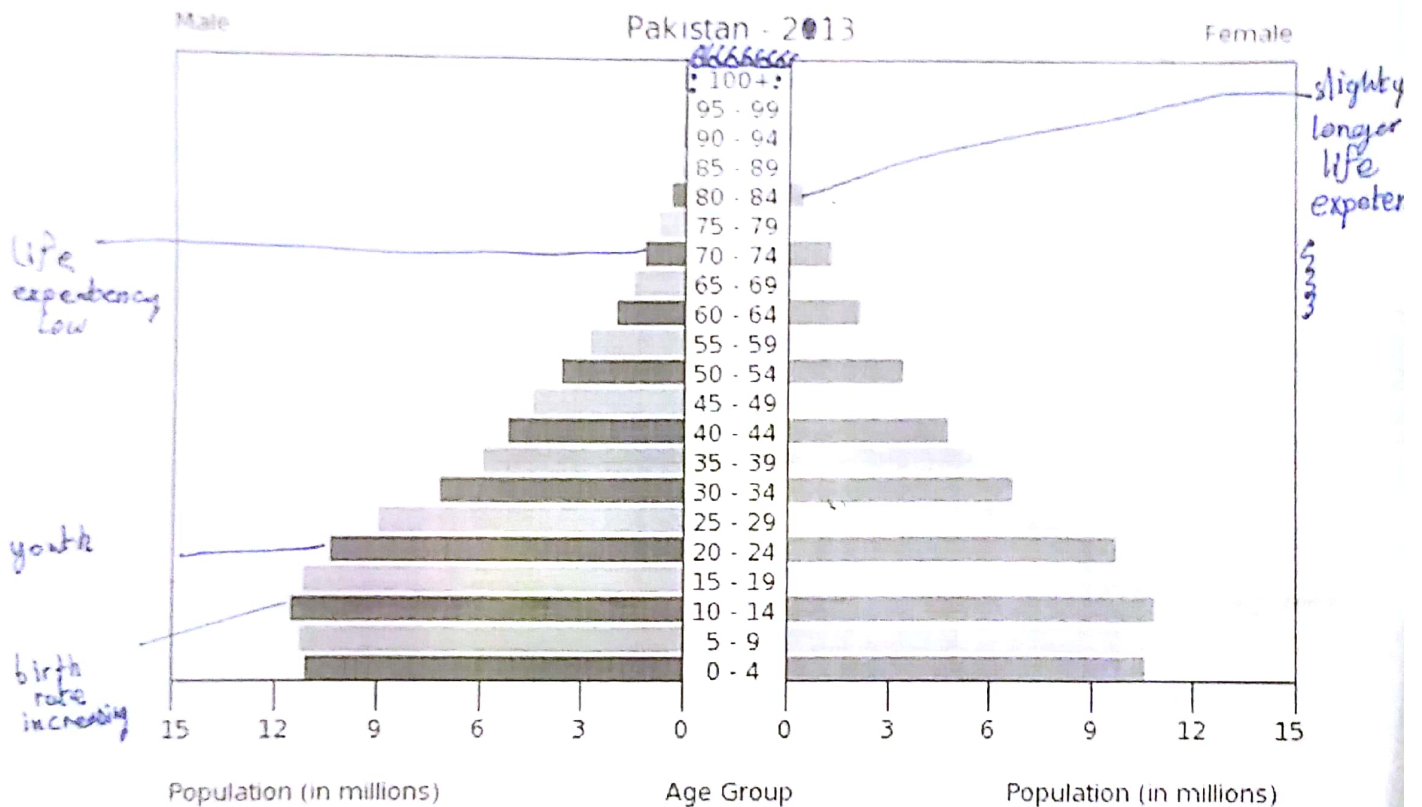
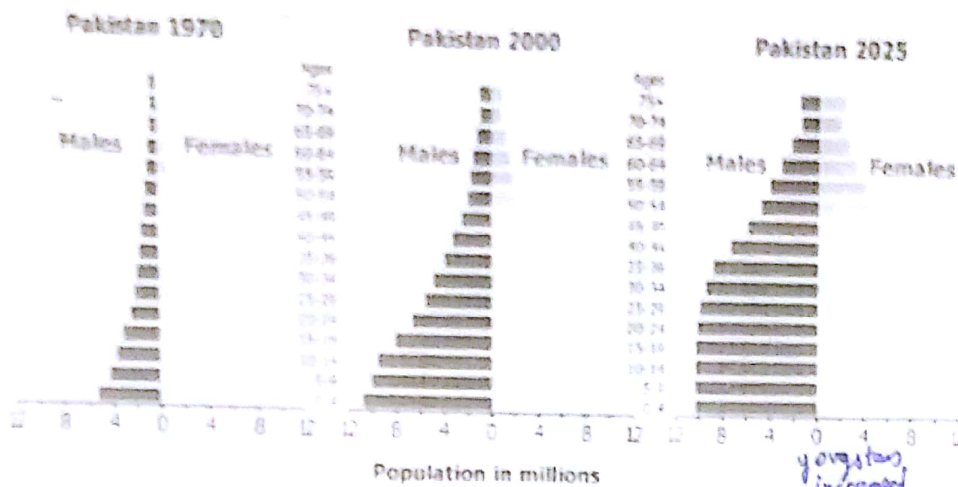
Population Pyramid

A population pyramid illustrates the age and sex structure of a country's population and may provide insights about political and social stability, as well as economic development. The population is distributed along the horizontal axis, with males shown on the left and females on the right. The male and female populations are broken down into 5-year age groups represented as horizontal bars along the vertical axis, with the youngest age groups at the bottom and the

Q. Problems for internal migration

- Difficult to accommodate
- Unplanned growth of cities
- Over population - burden on resources
- Traffic congestion
- Social problems
- Food shortage
- Crime rates increased
- Population in rural areas decreased

oldest at the top. The shape of the population pyramid gradually evolves over time based on fertility, mortality, and international migration trends.



Disguised unemployment: hidden unemployment; occurs when the # of number of workers are than required. It is difficult to make an accurate estimate of the disguised employment.

Age structure: 0-14 years: 34%
15-24 years: 21.6%
25-54 years: 35.1%

55-64 years: 5%
65 years and over: 4.3%

What causes unemployment?
- High rate of population growth (2.3%)
- Mechanization in agriculture
- Improvements in technology
- Cultural restraints
- Mismatch in demand and supply
- Low distribution/creation of small farms
- Electricity shortage

Employment: comprised of all persons
- a person above 14 years who worked at least 1 hour either paid or self-employed

0-14
60-above
dependent age
- more tension
- hospitals overcrowded
- schools overcrowded
- financial spend on hospitals and schools
- fall in death rate
- more people in middle age group