I N D U S T R Y

Meaning of the Related Terms:- Meanings of the commonly used terms are given below:

1. **Industry**:
    A manufacturing unit is known as industry.

2. **Primary Industry**:
    Any extractive industry, including mining, quarrying, agriculture, Fishing and Forestry are also included in it as they involve in extraction of resources also.

3. **Secondary Industry**:
    In this type the raw materials are processed or components are assembled.

4. **Tertiary Industry**:
    This industry supply services like retailing.

5. **Quaternary Industry**:
    This is concerned with the professions and these services that require a high level of skills, expertise and specialization. It includes education, research and development, administration and
    financial services such as accountancy.

6. **Manufacturing Industry**:
    Industries, which produce or assemble manufactured products are known as manufacturing industries and the goods produced by these industries are known as final products. The final product is such a product in which further processing is not possible.

7. **Processing Industry**:
    The industry, which involves in changing of raw material into machine able form, is known as processing industries e.g. cotton ginning.

8. **Heavy Industry**:
    Industries producing capital goods or machinery are known as heavy industries. e.g. Pakistan Machine tool Factory.

9. **Capital Intensive Industry**:
    These industries are more machine oriented and more capital intensive or require more money to set up the industry.

10. **Labour Intensive Industry**:
    The industries which require more working hands and less automation. They are known as labor intensive industries.

11. **Raw Material Oriented Industry**:
    The industries which are established at the place of raw material. e.g. Sugar Industry.

12. **Market Oriented Industry**:
    Business is one which carries out market research to find out consumer wants before a product is developed and produced.

13. **Raw Material**:
A product obtained directly from the ground or Sea. e.g. farming, forestry, mining.

14. **Agro-based Industry:**
Industries which use agricultural products as their raw materials are called agro-based industries.

15. **Cottage Industry**:
The industries in which the hand made items are produced for market. In such industries the owner is self employed and helped by the family members only.

16. **Small Scale Industries**:
In such industries mechanical power is used with a limited number of hired labor along with the family members. If electricity is used, then the number of workers are **20** and if not used then the number of workers are **50**.

Factors influencing the Location and Development of Industries:

A. **Natural Factors**:
1. Cheap, Flat and well drained land accessible easily through natural routes.
2. Moderate / tolerable climate.

B. **Human Factors**:
Availability of:
1. Capital
2. Labor
3. Raw material
4. Power supply
5. Infrastructure Facilities (Gas, Water).
6. Efficient Transport
7. Industrial Estate
8. Government Policies

Input: A resources required for industrial product.
Processes: The methods by which the raw materials are converted to finish goods.
Output: The products which are produced.

Industry   As   A   System

Inputs	Processes	Outputs
Natural / Physical	e.g.	Processed goods such as
Flat Land (cheap & well drained) drinks,	Smelting	Cement, Ghee, Soft
Natural routes	Weaving	Packets of tea.
Climate (moderate) as	Spinning	Manufactured goods such
Human Factors	Dyeing	Drugs, Fans.
Capital	Printing	Garments, Motor cycle.
Labor	Knitting	Flowers.
Raw Material	Stitching	
Power Supply	Tanning	
Infrastructure Facilities (Gas & water)	Moulding	
Efficient Transport	etc.	
Industrial Estate		
Government Policies		
Machinery		

By Products   **Profit**
Molasses. Bagasse

Profit invested back into inputs

Sugar Industry   (Raw Material Oriented)

It is important an agro based and biggest industry of Pakistan. Sugar cane and Beet are the main raw material of sugar industry. After the partition in 1947 there were only 2 sugar industries in Pakistan namely Rahwali (Gujranwala) and Takht Bhai (Mardan). At present 78 sugar plants are working in different parts of the country (Punjab 40, Sindh 32, NWFP 6 and no sugar mill in Baluchistan).

In Punjab most mills are along the eastern side where main sugar cane growing belt is located. Some are located towards the western side.

In NWFP 6 sugar industries are working, 2 industries based on sugar cane and the remaining on Sugar Beet. In NWFP, Sugar Mills are located towards the western and upper parts where as in Sindh most are located in the central and lower parts.

Sugar Industry As A System

Inputs	*Processes*	*Outputs*
Natural / Physical	e.g.	White sugar
Flat Land (cheap & well drained)	Washed	
Water	Crushed	
Climate (moderate)	Juice Collected	
Human Factors	Refined	
Capital	Crystallized	
Labor (Skilled & unskilled)	Whitened / made into white sugar	
Raw Material (Sugar cane)	Molasses / brown sugar	
Power Supply	Bagasse produced (a waste product)	
Machinery	etc.	
Efficient Transport		
Packing Material		
Government Policies		

By Products   *Profit*
Molasses. Bagasse
Press mud.

Profit invested back into inputs

Uses of By Products: (Sugar Mill)

Bagasse:-   It is dry pulpy residue left after the extraction of juice from sugar cane.
         Used as a fuel
                  Can be used to generate electricity
                  Animal feed
                  chipboard / paper / basket.

Molasses: It is thick, dark brown juice obtained from raw sugar during the refining process. It is made from either sugar cane or sugar beet juice which is boiled down to a syrup. Sugar crystals are extracted from the syrup and the remaining dark liquid is molasses.

         Used as animal feed / synthetic rubber / packaging / chemical industry
         citric acid / alcohol / fuel.

Study **Fig.1,** which shows the location of Sugar mills in Pakistan.
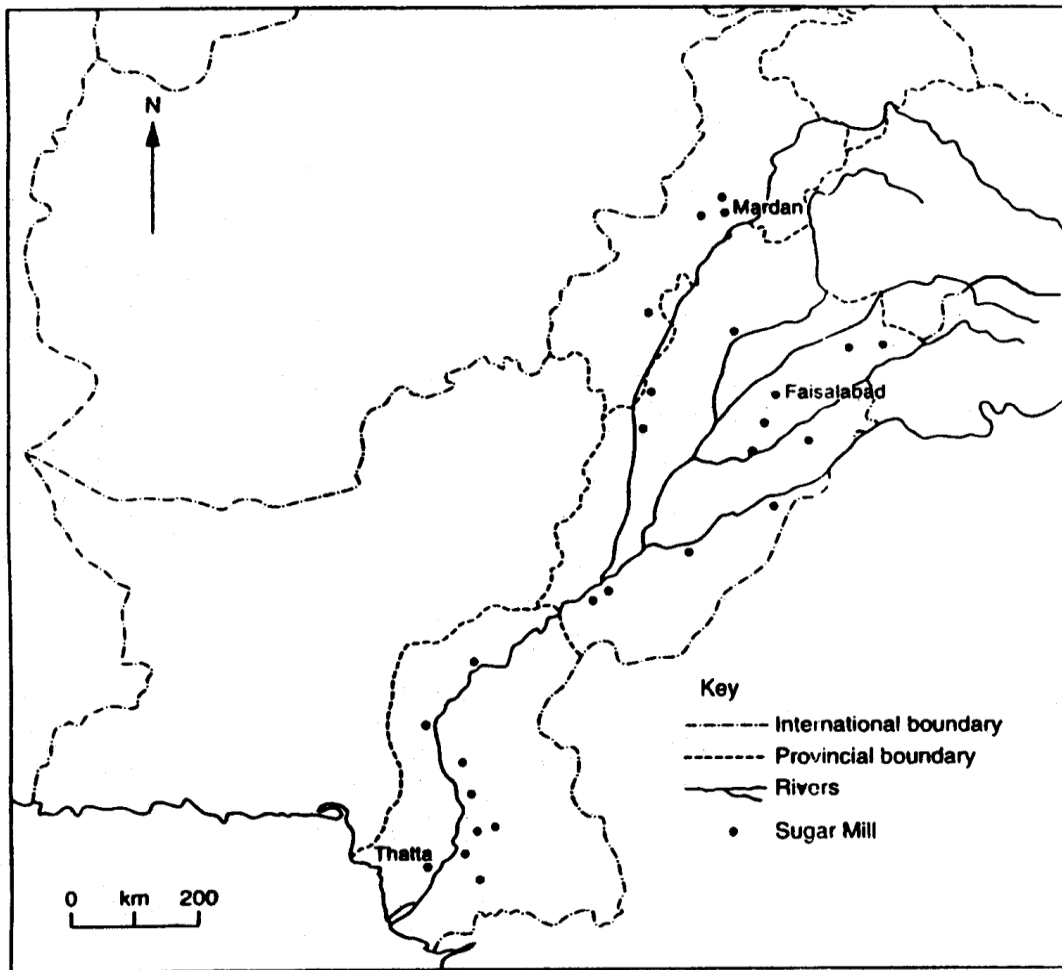

Fig.1

Q.1.   Describe the distribution of the sugar mills.
Ans.   Widespread / from north to south.
Along the rivers.
Especially in east.
Upper Indus Plain / Punjab.
Lower Indus Plain / near the Indus in Sindh
A few in NWFP.
None in Balochistan.
None in extreme north.

Q.2.   Explain why sugar mills must be close to areas of sugar cultivation.
Ans.   Must be crushed quickly after / within 48 hours of harvesting / cutting.
Rapid loss of weight after cutting.
Rapid loss of sugar content.
Keep down transport cost as bulky / heavy.

Q.3. **What happens to sugar cane from the time it is fully grown to when sugar juice is extracted?**

Ans. Cut by hand / manual labor
Transported by bullock cart / lorry / truck
Quickly transported
Scrubbed with chalk to remove dirt and smell
Crushed to remove juice in heavy rollers.

Q.4. **Select a sugar mill at one of the following locations:**
Faisalabad   Mardan   Thatta   Jhang

Ans. Flat site on Indus plain (valley floor) in vale of Peshawar
Sugarcane grown in area around mill
Power provided by use of bagasse a by product of sugar industry
Power provided by HEP
Water from River Swat / canal / River Indus / Lake Haleji
Skilled labor trained at universities / colleges in Pakistan / abroad
Cheap labor (unskilled) nearby towns
      Machinery imported / made in Taxila
      Financial backing from government / banks / foreign investors
      Good network of road.

Q.5. **At sugar mills the milling season lasts only 160 days. What problems does this cause**
and how might they be overcome?

Ans. **Problems**
Seasonal employment / unemployment for rest of year
Skilled workers may be lost to other industries permanently / shortage of labor
Machinery deteriorates with lack of use.
Solutions
Develop industries using the by products
Casual labor migrate to other employment / work in cottage industries
Offer incentives to keep / attract labor.

Q.6. **Explain the causes of sugar crises in Pakistan.** .

Ans. 1. Rapidly increasing population
2. Demand increasing due to growth of hotels and shops
3. Fluctuations in the yield of sugarcane due to bad weather conditions and the attack of pests and diseases.
4. Low recovery of sugar from sugarcane
5. Dispute between the growers and the mill owners.
6. Only 40 % of the total yield is used for making sugar and rest is crushed for making Gur (raw sugar).
7. Political instability.

Q.6. **Name two by-products from sugar-cane processing and give a use of each of them.**

Ans. **Bagasse**: Paper / chipboard / baskets / animal feed / fuel.
Molasses: Animal feed / synthetic rubber / packaging / chemical industry citric acid / alcohol / fuel.

Cotton Textile Industry (Market Oriented)

It is the largest industry of Pakistan. It provides employment opportunities to 50 % of industrial labor force. It contributes 7 % of G.D.P. to the economy of our country and also a source of foreign exchange. It has been established in different parts of our country i.e. Karachi, Faisalabad, Hyderabad, Multan, Lahore and other small cities like Jhang.

Cotton   Textile   Industry   As A System

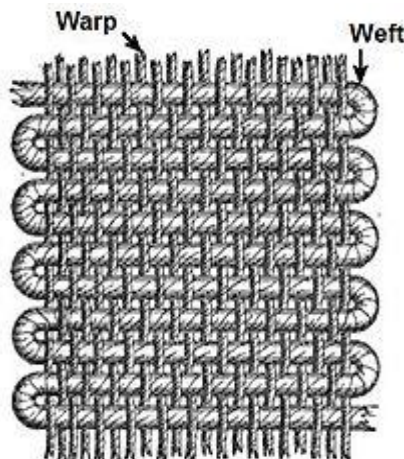| *Inputs*	*Processes*	*Outputs*
Natural / Physical	Spinning	e.g.
Flat Land (cheap & well drained)	Weaving	Cloth, Garments.
Natural routes	Bleaching	Yarn, Towels.
Climate (moderate)	Dyeing / Printing	Hosiery.
Human Factors	Cutting	
Capital	Stitching	
Labor	Packing	
Raw Material (Raw Cotton)		
Power Supply		
Infrastructure Facilities (Gas & water)		
Efficient Transport		
Machinery		
Government Policies		

Profit

Profit invested back into inputs

Ginning: It is a process of separating cotton seed from lint for further processing in textile **industries**.

Spinning: It is the process of making yarns from the textile fibre is called spinning.

Weaving: It is a method of textile production in which two distinct sets of yarns or threads are interlaced at right angles to form a fabric or cloth.

Knitting: It is a method by which yarn is manipulated to create a textile or fabric.

Study **Fig.2**, which shows the distribution of the cotton textile industry in Pakistan.
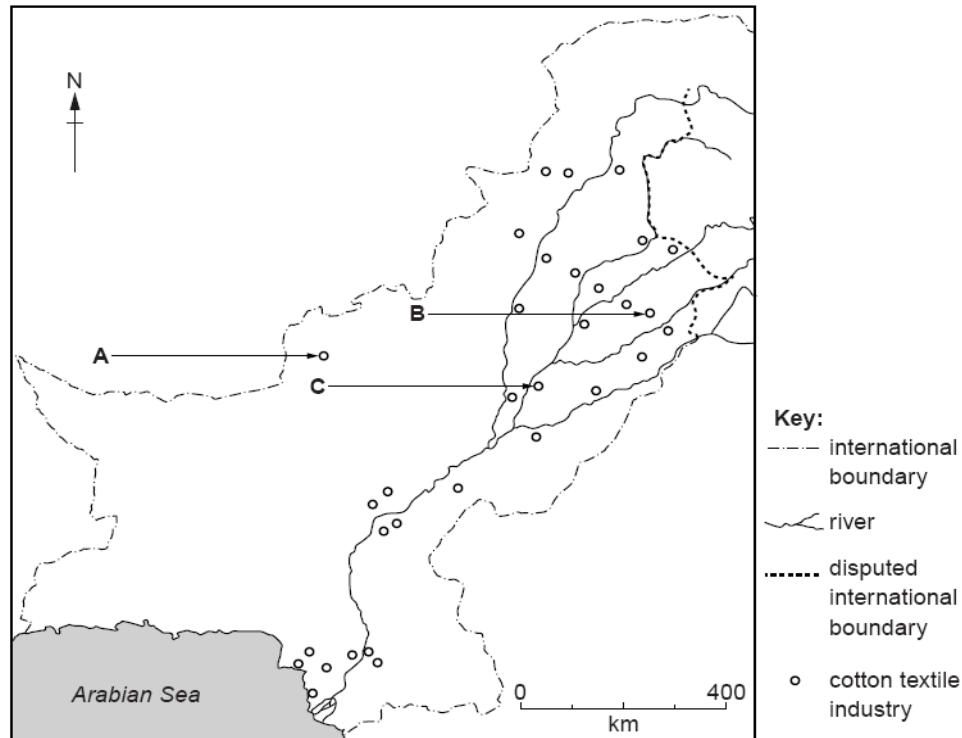

Fig.2

Q.1.   Describe the distribution of the cotton textile industry.
Ans.   Most factories in Punjab
Along rivers (in Punjab) River Indus (in Sindh)
Southern / Lower Sindh e.g. Hyderabad, Karachi
Northern / upper Sindh e.g. Sukkur, Larkana
KPK e.g. Peshawar, Nowshera
Northern Balochistan e.g. Quetta.

Q.2.   Two of the three main cotton textile manufacturing centers of Pakistan are situated within areas which grow cotton. Name one of these centers.
Ans.   Faisalabad and Hyderabad.

Q.3.   Explain why Karachi / Faisalabad are the largest cotton textile manufacturing centers in Pakistan.
Ans.   Capital available from investors.
Cotton growing area in Indus valley of mid-Sindh accessible.
Major roads from cotton growing areas. Railway from cotton growing areas.
Electricity from national grid / nearby power station.
Imported machinery enters Pakistan through the Karachi sea port.
Close to sea port / dry port for exports.
Large domestic market. Government schemes (loans, EPZ, industrial estates).

Availability of labor. Better infrastructure facilities.
Flat land. International Airport.

Q.4. **Quetta is a 'market oriented' cotton textile manufacturing center. What does this mean?**
Ans.   Gateway for exports to Iran and Afghanistan. Its main advantage is its local market.
There is large population to buy the products. It is not a major producing area.

Q.5 **Explain what can be done to improve Pakistan's cotton textile industry.**
Ans.   Increase production of cotton crop / quality of cotton crop, Research into solutions to leaf-curl
virus, Irrigation, More investment/government support/tax holidays/loans
Address child labour/environmental issues to ease international restrictions
Modernise machinery/plant/technology, Increase availability of power/electricity
Training / education of workers

Q.6. **How may a cotton textile industry in Karachi / Faisalabad be affected by July floods**
in the Punjab Province?
Ans.   Cotton crop may be ruined / yield much reduced by floods.
Communication may be damaged.
Supply of raw material may be insufficient.
Price of raw material may be increased.
Production (of cloth) may be less.
Loss of revenue.
Lose market.
Cannot pay / keep skilled workers.
May have to import raw material (cotton).

Q.7. **List the following in order of production:**

Cloth	Raw Cotton	Cotton Yarn	Ready-made Garments
Ans. Raw cotton	Cotton Yarn	Cloth	Ready-made Garments.

Q.8. **From the above answer state one product of:**
    A. **a processing industry.**   **B.** **a manufacturing industry.**
Ans.   **A**.   A processing Industry
        Cotton Yarn / thread or cloth.
    B.   A manufacturing Industry
        Cloth or Ready-made Garments.

Q.9. **Explain why Lahore is an important center of the textile industry.**
Ans.   Cotton grown locally.
Machinery from HMC / Taxila.
Availability of labor.
Power supply.
Good transport.
Good telecommunication system.
Dry ports.
Export processing zone.
Industrial estates.
Big market.
Infrastructure facilities.

Q.10. Why is a large proportion of the production of cotton textile industry exported?

Ans. To make capital / improve trade balance.

To earn foreign exchange.

Good quality.

Good reputation of Pakistan.

Demand from abroad.

Popularity in the world.

Q.11. How can Pakistan maintain and increase the exports of cotton textile industry?

Ans. Improve quality.

More export processing zones.

More dry ports.

Machines to replace work.

New products.

Reliable supply.

Government incentives.

More large factories.

Better roads / communication.

Advertising.

Q.12. How does industry (cotton textile) in cities pollute the environment?

Ans. Effluent in river (effect on fishing, drinking water and irrigation).

Effluent in sea water (effect on fishing e.g. Indus delta. Mangrove forest).

Smoke / gases in air (health problem, acid rain, global warming).

Traffic congestion in urban areas.

Waste from factories and people.

Loss of scenery by construction.

Noise pollution.

Q.13. How may a cotton textile factory in Karachi be affected by July floods in the Punjab?

Ans. Cotton crop may be ruined / yield much reduced by floods.

Communications may be damaged.

Supply of raw cotton may be insufficient / delayed.

Production of cloth may be less.

Lose market.

Cannot pay / keep skilled workers.

May have to import raw cotton.

Q.14. What are the advantages and disadvantages of developing the cotton manufacturing industry in Pakistan?

Ans. **Advantages**.

Job opportunities. Cheap labor available.

Value-added exports. Less imports.

Can compete with other countries. Good reputation worldwide.

Disadvantages.

Lack of modern skills / education. Lack of money to invest.

Competition from other countries. Old machinery. Power shortage.

Poor roads and railways / transport to ports.

Lack of investment in other industries.
Water shortage for manufacturing.
Machines will replace manpower / loss of unskilled jobs.

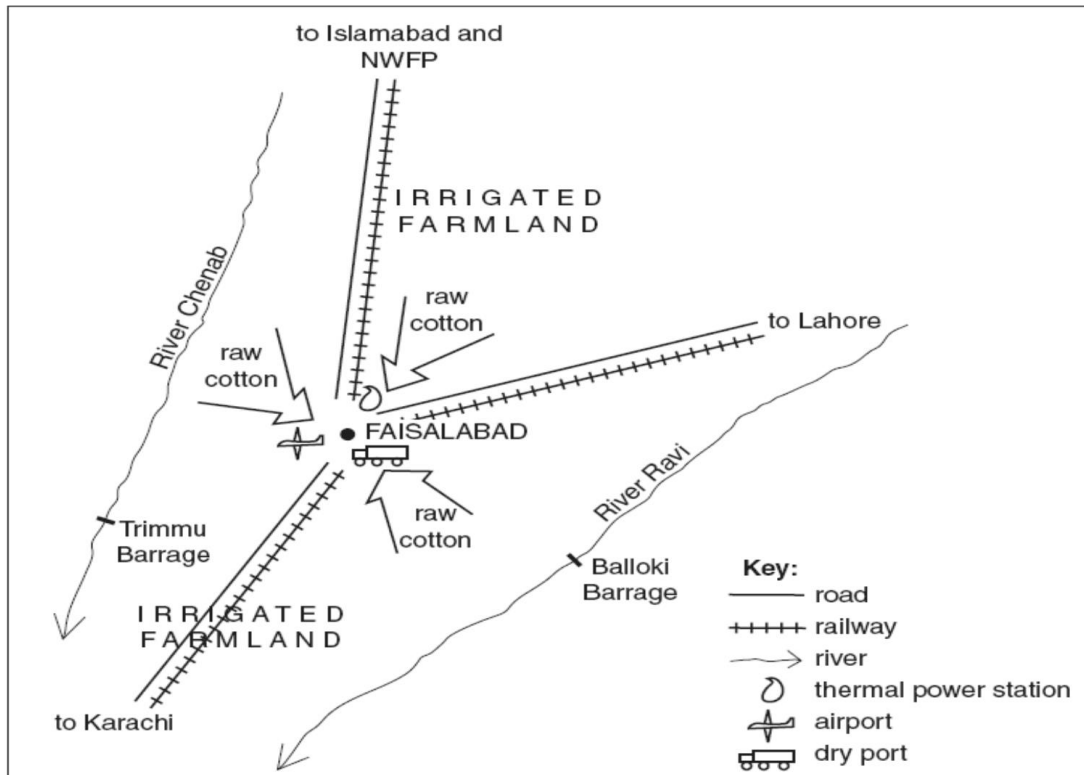Study **Fig.3**, which shows the location of Faisalabad.

Fig.3

Q.15. **State three factors shown on Fig.2, which influence the cotton industry in Faisalabad. For each factor, explain its importance to the development of this industry.**

Ans.

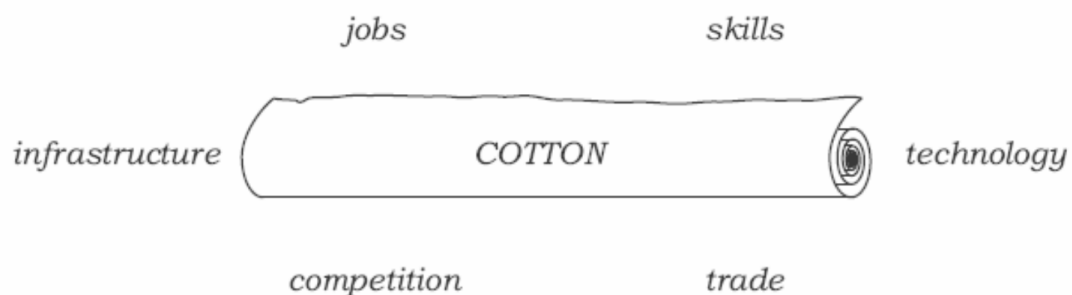|	
Irrigated Farmland	for raw cotton e.g. Rechna Doab.
Rivers / Barrages	supply water for washing cotton.
Road / Railway	for supply of goods, sales.
Dry port	for exports, transport to Karachi.
Thermal power	for electricity supply for machines etc.
Airport	for businessmen.

Study **Fig.4**.

Fig.4

Q.16. In recent years there has been little growth in the cotton textile industry. With reference to Fig.3, explain the advantages and disadvantages of increasing cotton textile production in Pakistan.

Ans. **Jobs**

More available, can reduce unemployment, higher income, formal employment.

But. Need for literacy and skills, may cause rural urban migration its consequences.

Skills

Beneficial to workforce, higher earnings.

But. Shortage of training at the present time.

Competition

Will improve standards.

But. Cannot compete, low quality of products, cheaper.

Trade

Increase trade, earn foreign exchange, improve balance of payments, pay off debts.

But. Poor roads / rail, inadequate port facilities.

Technology

Good for development, can improve quality and or quantity.

But. High cost, lack of skilled workforce, unemployment, shortage of power, more imports.

Infrastructure

Stimulates construction of better roads, railways, power supply, water supply.

But. Higher cost, shortage of sources e.g. power, water.

Q.17. Give an example of a job in each of the primary, secondary and tertiary sectors of the cotton industry.

Ans. **Primary**: Farming, picking, bringing water

Secondary: Washing, dyeing, spinning, weaving

Tertiary: Sales, transport, management.

Cement Industry (Raw material Oriented)

Cement is key factor in economic development of the country. There are many favorable factors for the development of cement industries. e.g.

1. Availability of raw material (Limestone and Gypsum).
2. Good domestic market with high demand from the construction industry.
3. Natural gas is used as a cheap fuel.

At the time of independence, Pakistan had 5 cement factories and was the exporter of cement. But with the development work starting in Pakistan the country became an importer of cement. Now there are 24 cement units are working in the country. Out of these 24 units, 4 units are in the public sector and the rest are in the private sector.

Although the cement industry is based on local raw material. however, there is rising trend in the price of the cement for the last few years. The main causes are (i) decline in production (ii) General inflationary trend in the country.

The cement industry is wide spread in the country due to availability of raw material. The following are 24 cement factories located at various parts of the country specially in all the provinces e.g. Dandot. Gharibwal. Attock. Mianwali. Daud khel. Rawalpindi. D.G.khan. in Punjab province. Hazara. Kohat (KPK) Karahci. Sukkur. Hyderabad. Thatta. (Sindh) Kalat (Baluchistan).

Cement Industry As A System

Inputs	*Processes*	*Outputs*
Natural / Physical	Grinding	Cement.
Limestone	Heating	Cement Powder
Gypsum. Water	Mixing	Cement Blocks.
Natural gas / Coal	Packing	Bricks.
Clay / Shale		Slabs.
Sand.		

Human Factors
Capital
Labor
Machinery
Power
Technology
Efficient Transport
Skills.
Packing Material

Profit

Profit invested back into inputs

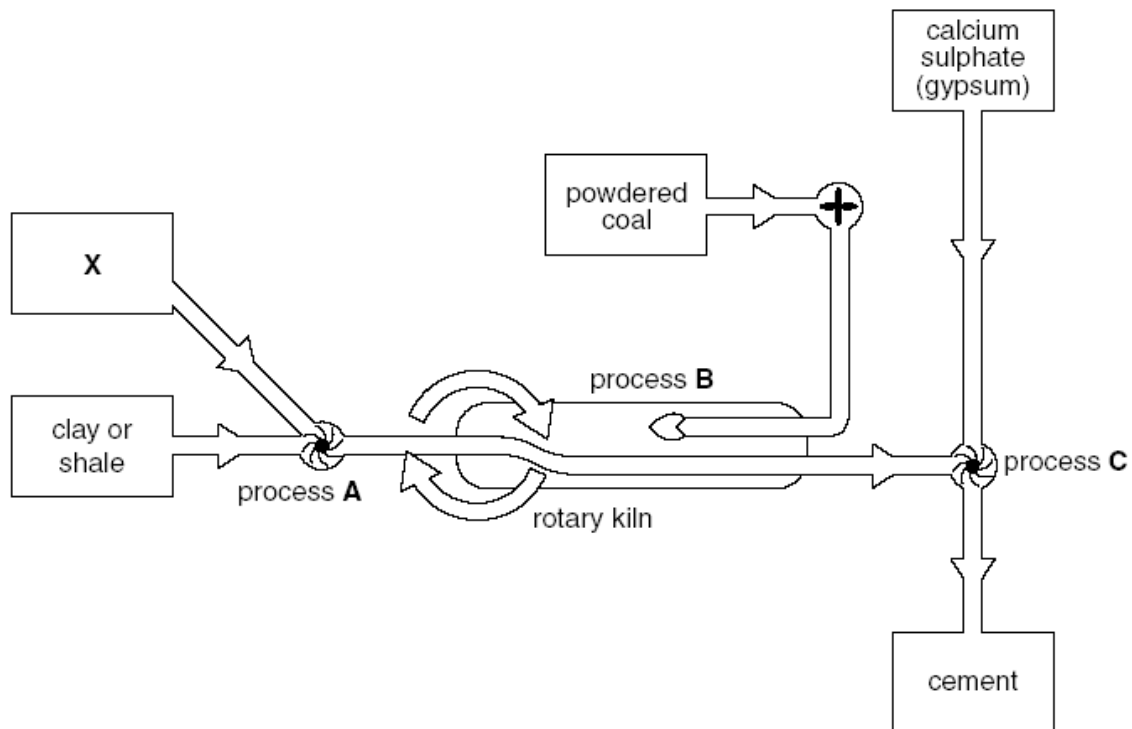**Fig.7** shows how cement is made.

Fig.7

Q.1.   State three natural inputs that are needed to make cement.
Ans.   Limestone. Gypsum / Calcium Sulphate. Natural gas / Coal. Clay / shale.
Water. Sand.

Q.2   Explain the importance of three human inputs at a cement factory.
Ans.   Electricity for power.
Road / railway for transport.
Labor for good production.
Telecommunication for supply / sales.
Machinery for fast / efficient production.
Capital for investment.

Q.3.   Why is there a large demand for cement in Pakistan?
Ans.   Domestic construction e.g. houses.
Industrial construction e.g. Factories.
Institutional buildings / schools / hospitals / offices.
Communication e.g. roads. Bridges. railway sleepers.
Port developments.
Water management e.g. Dams. canals. embankments.
Pakistan has insufficient timber.
Pakistan has insufficient steel.
Pakistan has huge deposits of limestone to make cement.

Q.4.   Give three reasons for the continuous increase in cement manufacture from 2000 to 2009.
Ans.   Industrial / economic development,

Urbanization / construction
Better / more housing, roads, offices, factories
Population increase
Raw materials cheap
Raw materials readily available.

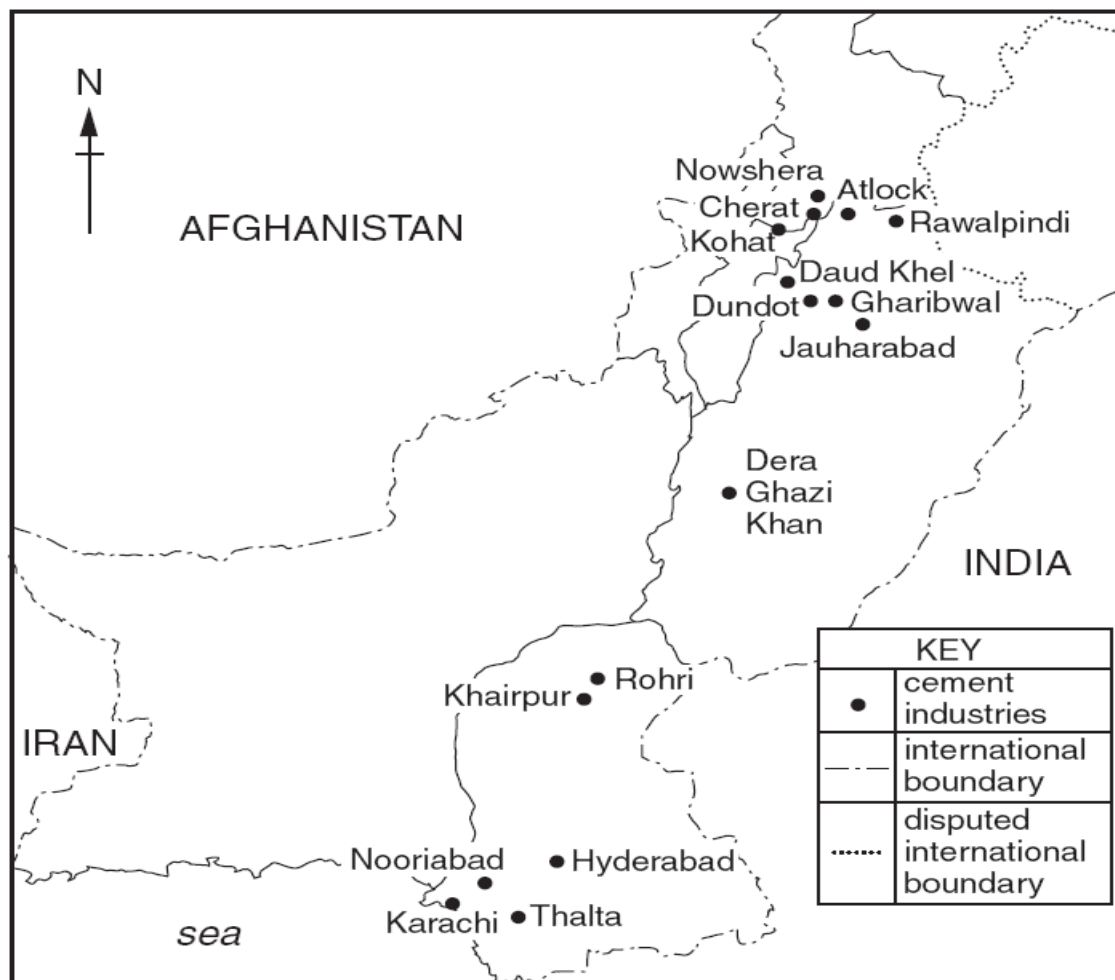Study **Fig.8,** showing the distribution of cement factories in Pakistan.

Fig.8

Q.5. **Describe the distribution of cement factories in Pakistan.**
Ans. Widespread and exist north to south
Mostly in Indus plain and few in KPK
Close to coast in Sindh
None in Balochistan.

Q.6. **Suggest why there are no cement factories in Balochistan.**
Ans. May be no limestone / gypsum
Mining difficulties due to mountains
Low rainfall / drought makes working difficult
Lack of water
Transport problem

Study the Photograph. A, showing a cement factory near Ghulamullah, in Thatta District.

Q.7. **Describe the scene in the photograph.**

Ans. Flat and large area

Rough road to factory.

Vegetation in background.

Chimney.

Smoke / Dust / air pollution.

Stones / rocks.

Tyre tracks.

Fertilizer Industry

Introduction:- Pakistan is an agricultural country which require large quantity of cow dung and other natural manure. But they cannot meet the growing demand. Therefore chemical fertilizers gain special importance and three types of chemical fertilizers are used namely Nitrogenous fertilizers, Potassium fertilizers and Phosphorus fertilizers. The consumption of chemical fertilizers has increased specially after green revolution. Production of chemical fertilizers in Pakistan was started in 1960s. When industrial development corporation established two fertilizer industries at Faisalabad and Daudkhel. Once natural gas was discovered in 1952 at sui that too proved a rip source of chemical fertilizers and a factory was set up in Multan (Pak-Arab Fertilizer Company). It started production in 1979. Since then Urea plants have been established in Sheikhupura, Mirpur Mathelo, Haripur, Machigot, Dharki and a super phosphate plant at Jaranwala.

Fertilizer Industry   As A System

Inputs

Natural / Physical

Flat Land (cheap & well drained)
     Phosphorus.
Natural Gas, Nitrogen, Gypsum
     Nitrogenous.
Sulphur, Potassium / Potash
Phosphate, Ammonia,
Fish / animal remains / bones
Climate (moderate)

Human Factors
Capital
Labor
Machinery
Power Supply
Infrastructure Facilities (water)
Efficient Transport
Government Policies

Processes

Preparation of raw material

Chemical reaction

Separation of Fertilizer

(i)   Filtering
(ii) Evaporation
(iii) Prilling
(iv) Bagging / Packing

Outputs

Urea.

Potassium.

Profit

Profit invested back into inputs

Process

Rotten plants, animal waste and some required chemicals are put together in a big Iron container. The mixture is heated until it is converted into a thick paste. Now natural gas is added to it without burning in raw form. In last stage the paste is dried and its grains are made for easy application. Following are the fertilizer companies:
Engro fertilizer company, **Fauji** fertilizer company, **Pak Arab** fertilizer company, **Fatima** fertilizer company.

Q.1. **What is meant by the term 'fertilizer'?**

Ans.   A chemical addition to the land to make the soil more fertile.

Q.2. **Name two raw materials, apart from natural gas, which are used to make fertilizer.**

Ans.   Nitrogen. Sulphur. Gypsum. Potassium / Potash. Phosphate. Ammonia.
Fish / animal remains / bones.

Q.3. **Explain why most fertilizer factories are in the Punjab and northern areas of Sindh.**

Ans.   Main farming areas. Fertile soil. Good irrigation system.
Less flooding now to replace nutrients. Large population to feed.
Good roads for transport. Availability of raw material. i.e. Gypsum. Natural gas.

Q.4. **Why is it important that Pakistan manufactures its own fertilizers?**

Ans.   Expensive to buy.
Reduce imports.
Improve balance of payments.
Produce more food for large population.
Produce more crops for exports.
Increases employment.

Q.5. **What environmental damage can occur when a new fertilizer factory is built in a Rural area?**

Ans.   Loss of farmland.
Damage to roads.
Water pollution.
Noise pollution.
Soil erosion.
Traffic congestion.
Dumping of waste.

Study the **Fig.4**, which shows the location of fertilizer Industry in Pakistan.
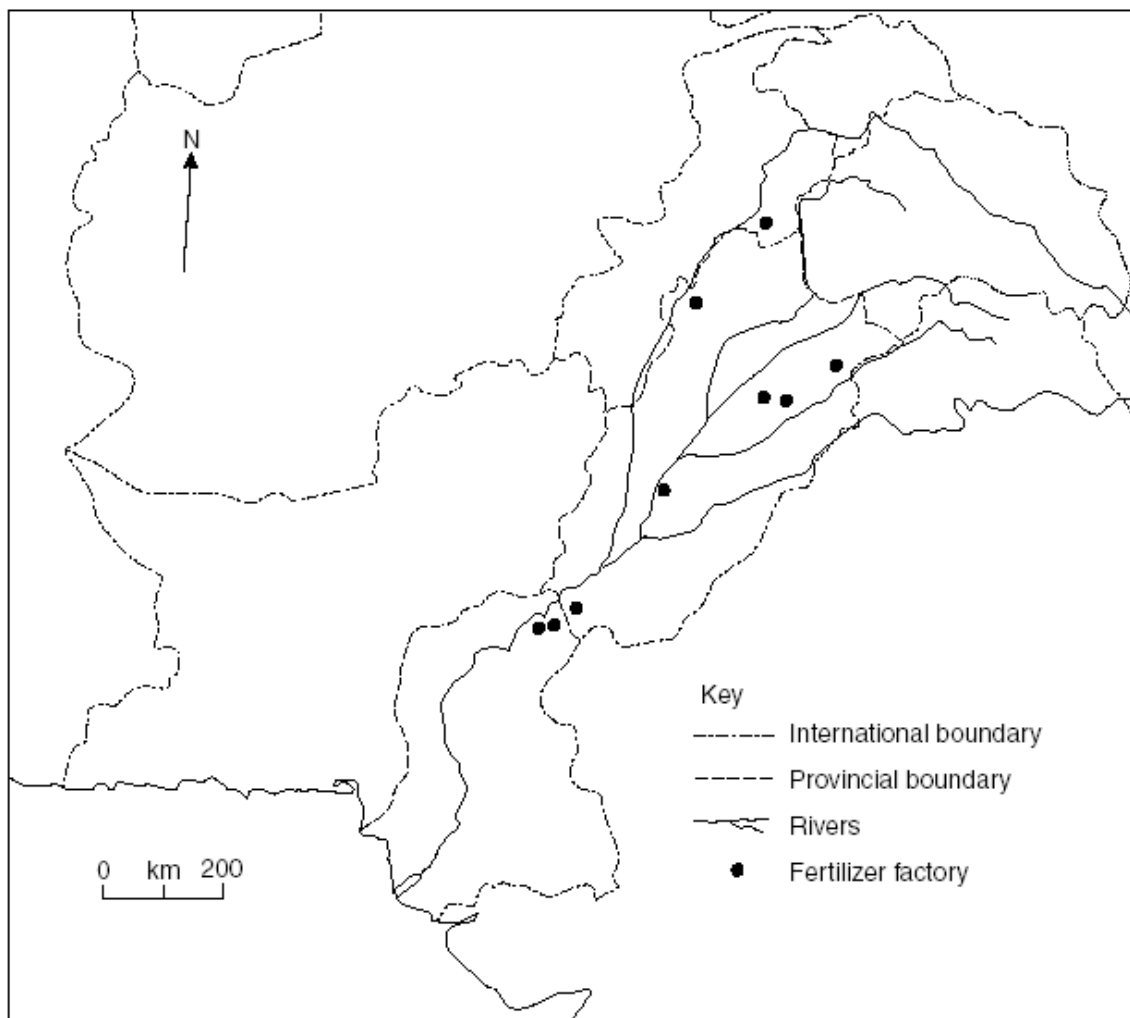

Fig.4

Q.6. **Describe the distribution of Fertilizer Industry in Pakistan.**
Ans. Less no. of fertilizer industries.
Along the rivers.
Mostly in upper Indus Plain.
North side of Sindh Province.
One in KPK.
None in Balochistan and in northern areas.

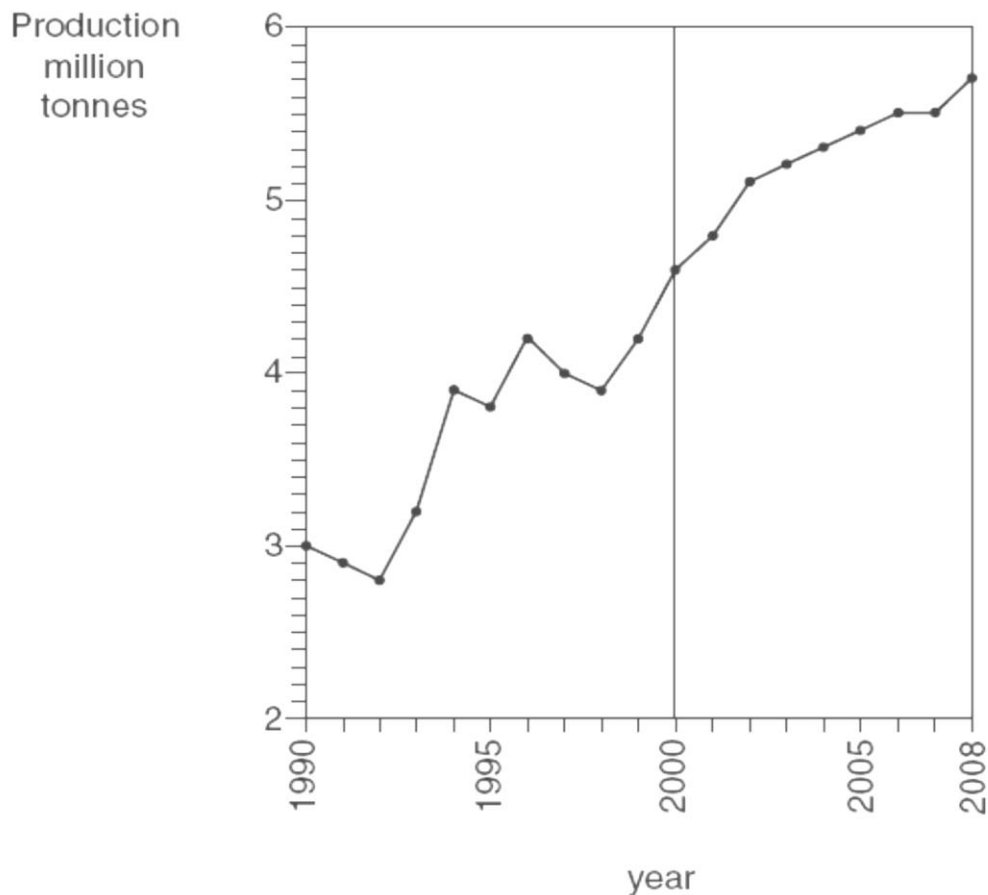Study **Fig.5**, which shows fertilizer production in Pakistan.

Fig.5

Q.7. **By how much did fertilizer production increase from 2000 to 2008?**
Ans.   1.0 – 1.2 / 1000 – 1200.

Q.8. **Compare the production from 1990 and 2000 to that from 2000 to 2008.**
Ans.   More variable 1991 – 2000 than 2000 – 2008.
Overall rate of increase .
3.0 – 4.6 / 1.6 million tones compared with 4.6 – 5,7 / 1.0 – 2 million tones.

Q.9. **What are the benefits of increasing fertilizer production for the people and the economy of Pakistan?**
Ans.   Higher yields.
More food production.
More agricultural exports.
Reduced imports of fertilizer, or improved balance of payments.
Less GNP. Higher farm incomes / profits.
        More jobs.
Cheaper cost of fertilizer.
More industrial goods (e.g. cotton).

Q.10. Fertilizers are used by farmers on their fields. Suggest three problems that using fertilizers could cause for the environment and people of Pakistan.

Ans. Can upset ecosystems,
May damage natural food chains
Damage to species / plants / animals,
Eutrophication / loss of oxygen in water
Fish die / algae growth limits light into water
Polluted water / chemicals get into water cycle
Illnesses to people
Shortage problem.

Q.11. Chemical fertilisers to help increase agricultural production are one of Pakistan's main imports. These imports are expensive. Read the following two views:

A

Pakistan should manufacture more of its own chemical fertilisers to reduce the need for importing them.

B

Pakistan should rely less on chemical fertilisers and reduce the need for importing them by using natural alternatives.

Which view do you agree with more? Give reasons to support your answer and explain why it is important to reduce imports of chemical fertilisers.

Ans. **Chemical fertilisers**
Modern factories (e.g. Enven-Engro in Daharki, Sindh) are energy efficient / environmentally compliant
Cow dung is in insufficient amounts / used as a fuel in rural areas
Pakistan has large supplies of natural gas (the main raw material for fertiliser) (at Sui)
Natural alternatives
Fertiliser factories use large amounts of fuel (especially natural gas)
Ample source of manure from large livestock sector
Ample source of compost from agricultural waste
Alternative methods of improving soil quality are possible (crop rotation / nitrogen-fixing plants / beans / legumes / avoiding overcropping / multi-cropping)
Importance
The cost of imports (trade / balance of payments deficit / imports>exports) (fertilisers one of top 5 imports / 2% imports)
Chemical fertilisers cause water pollution (agricultural runoff containing chemicals goes into streams / rivers / causes eutrophication)

Iron and Steel Industry (Capital Intensive)

Introduction:- The establishment of iron and steel industry is considered to be a milestone road to industrialization. Pakistan steel mill corporation with technical and financial assistance from USSR (Union of Soviet Socialist Republic). It was established in December 1973.

It is located about 40 kilometers east of Karachi at Pipri on Gharo Creek near Port Bin Qasim. The capital cost of steel complex was 25.5 billion rupees. The steel mill covers an area of about 75.4 km2 including 38.9 km2 of steel town ship (residential area of workers). The production capacity of Pakistan steel mill is 1.1 million tones of steel annually and has a potential to expand to over 3 million tones.

Iron ore and **Coal** used as a raw material in this industry. But both raw materials are not enough in Pakistan so we import from abroad. We import iron ore from Australia, Brazil, India and Liberia and coal from Australia.

Iron and Steel Industry As A System

Inputs

Natural / Physical
Flat Land (cheap & well drained)
        Limestone. Water
cast Billets.
Manganese. Coal (Anthracite)
Chromite
Climate (Moderate)

        Galvanised Products.

Human Factors
Capital
Labor
Machinery
Power
Technology
Efficient Transport
Skills.

Processes
Mining
Grinding
        Concentration

Heating
Refining
Casting

Outputs
Sheets.
Plates.
        Rolled &

Coils.
Slabs.
Girders.

Profit

Profit invested back into inputs

Q.1. **Explain why the Pakistan Steelworks is called 'a large scale industry**'.
Ans. Handles large quantities of raw materials.
Large production / large output / generates large income.
Large area / site. Large electricity use / local power station.
Large gas use / large pipeline. Large workforce. Higher output per worker.
Large capital. Mechanised / Standardisation of products.

Q.2. **Explain why Steel Mills was built on Gharo Creek.**

Ans.   Area of flat land
Deep water
Wide / large area of water
Sheltered water
Cheap / unpopulated area
Near / 20-23 kms from center of Karachi
Close to National Highway to Karachi
Close to main railway line to Karachi

Q.3. **Name three raw materials used in the Pakistan Steel Mills**.
Ans.   Iron ore, coal, limestone, manganese, chromite.
Q.4. **Why are most of the raw materials imported**?
Ans.   Iron ore not mined in Pakistan.
Coal poor quality.
Small output / lack of development of resources.

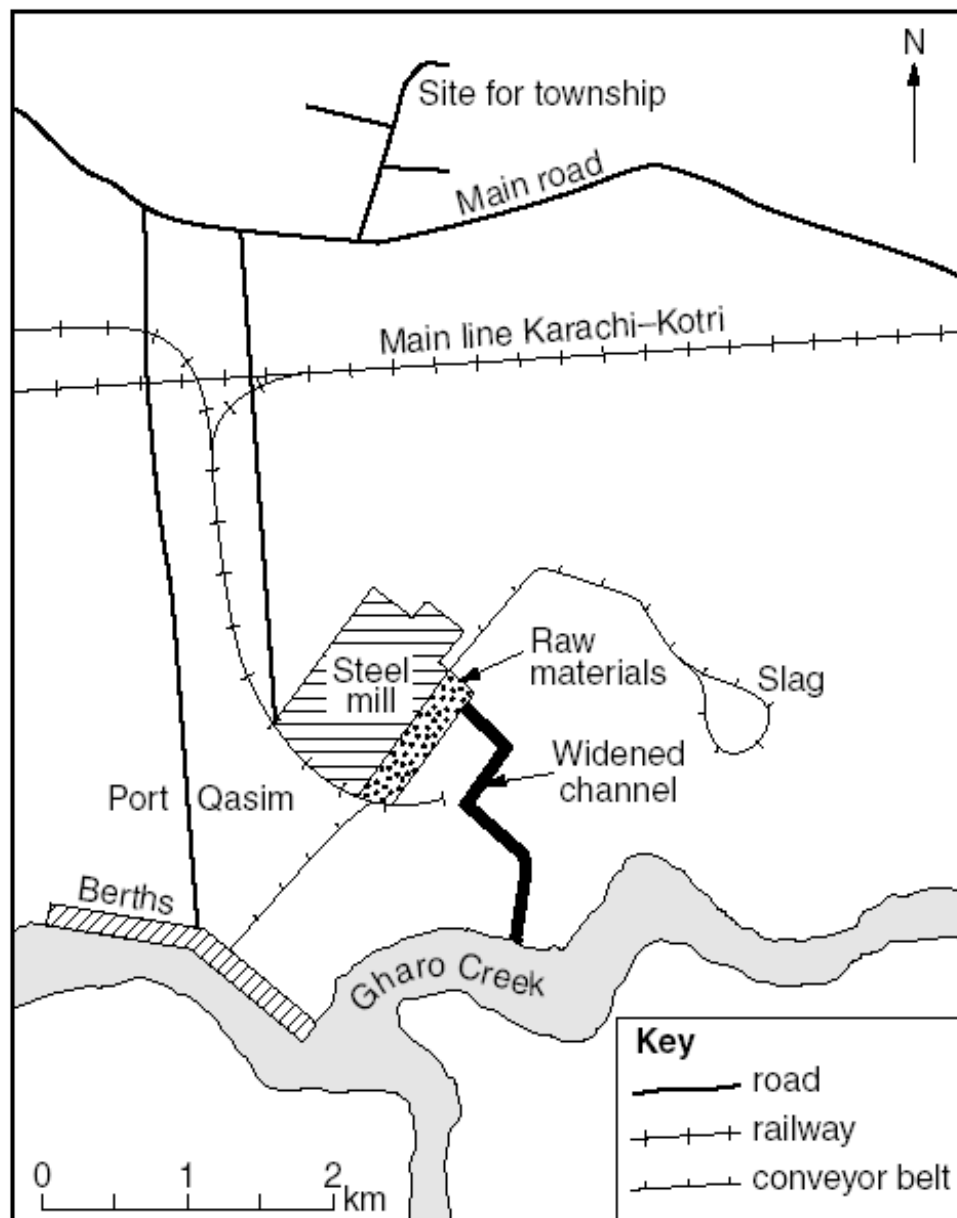Study **Fig.6**, which shows the location of **Pipri Steelworks**.

Fig.6

Q.5. **With reference to Fig.6, explain why the steel mills were located here**.

Ans. Coastal site / Port (Bin) Qasim for imports
Berths by creek for unloading
Widened channel for effluent / shipping
Railway / road for supply of limestone / workers and for distribution of finished products
Township / houses for workers
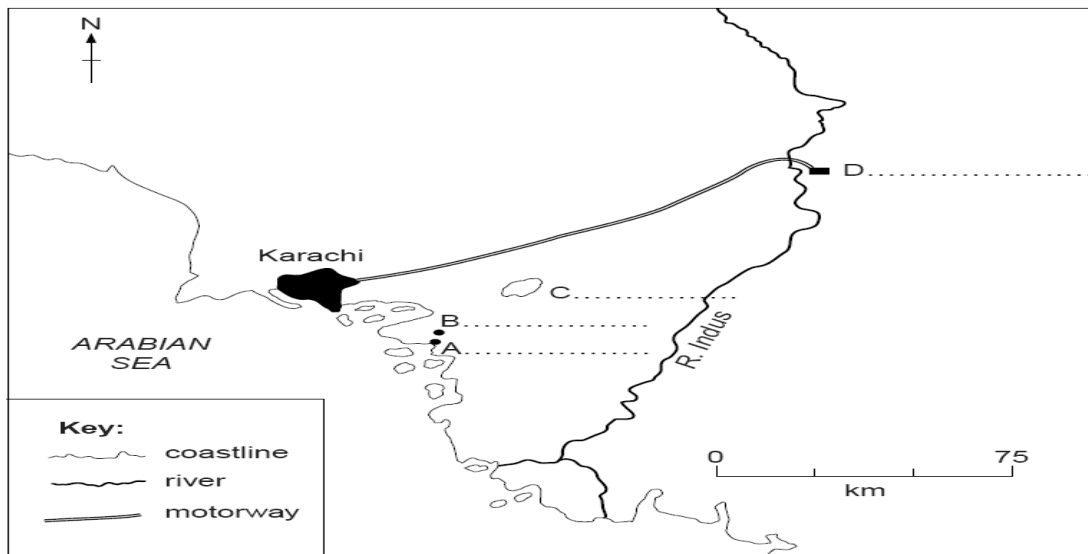Large / open site for waste disposal, storage, building etc.

Study Fig.7.

   Fig.7
Name the following:

A.   **the port where iron ore and coal are imported**.
     Port Qasim.
B.   **the site of the Pakistan Steelworks**.
     Pipri.
C.   **the lake that supplies water to the Pakistan Steelworks**.
     Haleji.
D.   **the destination of the motorway from Karachi**.
Hyderabad.

Read the extract below.
Imports of steel increased by 37 % from 2004 to 2005 as a growing amount of machinery and industrial steel products flowed in. This is more than any government predictions.

Q.6.   Explain the advantages and disadvantages of increasing steel production in Pakistan.
Ans.   **Advantages**.
          Cheaper supplies (than imports)
          Saves foreign currency / improve balance of payments / reduce imports
          Can be used for development / industrialization e.g. construction, machinery
          Larger GNP
          Independence from other countries
          Employment opportunities.

          Disadvantages
          Lack of raw materials
          High cost of imported iron ore / other raw material
          Burden on economy / less development
          Cost / lack of machinery / technology

Cost / lack of infrastructure / power supplies / roads etc.
Lack of skilled labor
More waste / named pollution
May encourage rural-urban migration

Q.7. **Explain how human inputs such as those can improve production**.
Ans.   **Labor.**   Work machine, carry materials, office work.
            Capital.   Wages, machines, technology, investment.
            Machinery.   Faster, better quality, new products.
            Skills.   Computers, office work, machines.
            Technology.   Quality, speed, modernization.
            Transport.   Faster, larger supply, bigger markets.
            Power.   Efficiency, speed, quality.
            Govt. policies.   Tax concessions, training.

Q.8. **Why is over 50 % of the output of Pakistan Steel sent north from Karachi to the**

         Punjab?
Ans.   Construction of buildings / Bridges.
            Machinery for industry.
            To Taxila. Heavy engineering.

Q.9. **Why is coal imported for iron and steel industry**?
Ans.   Poor quality of local coal.
            Mixed with local coal.
            Not enough local coal.

Q.10. **What features of Pakistan Steel show that it is an industry in the 'formal sector'**?
Ans.   Large scale industry. Good quality goods.
                  Capital intensive.
                  Regular working hours. Regular wages.
                  Legal and registered. Employed labor.
                  In office / factory. Skilled labor. Mainly men. Pension scheme.

Other than steel making a number of engineering plants are working in the country detail of the some is given below.

Q.11.   It has been proposed that a large integrated iron and steel mill should be built on the outskirts of Rawalpindi, Punjab.

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80 km2 of land will be cleared for the mill and new infrastructure will be provided to the site by the local authorities. Large amounts of raw materials will be brought onto the site by road or rail and it is planned to produce up to 3 million tonnes of finished steel per year.

Evaluate how the new integrated iron and steel mill will affect the local people of Rawalpindi. Give reasons to support your answer. You should consider both benefits and problems in your answer.

Ans.   <u>Benefits</u>
Employment opportunities
Improvements to roads/other infrastructure
New settlements
Educational/recreational facilities
More trade for local shops
More work for local ancillary/related industries

<u>Problems</u>
Farmland/grazing
Air pollution/dust from chimneys, etc.
Visual pollution/eyesore
Roads/railways congested
Attracts migrants
Uses large amounts of water/power

<u>Ore</u>: A naturally occuring solid material from which a metal or valuable mineral can be extracted.

<u>Iron Ore</u>:   A rock or mineral from which iron can be extracted.

A Heavy Mechanical Complex

This complex was established at Taxila with Chinese help in 1979 and it has an annual capacity of 60,000 tones. Its main products are sugar mill's equipment, cement factory machinery, overhead traveling cranes, road rollers, Truck chasses and low pressure package type boilers.

Pakistan Machine Tool Factory

This was established at Karachi in 1968 with Swiss help, now it has grown into a sophisticated engineering complex. Its main products are engineering tools, transmission components and automotive parts.

A Heavy Foundry and Forge Complex

This was set up at Taxila with Chinese help in 1976. Its has steel melting capacity of 60,000 tones. Its mainly fulfills the needs of railways and automobiles and produce heavy machinery as well.

Karachi Shipyard and Engineering Works

It was started in 1956 and it can built and repair ships. Other than the local it also serves the foreign orders.