

An industry is a group of manufacturers or businesses that produce a particular kind of goods or services.

# Industry

It is concerned with the whole processing and the production of manufactured goods.



# Primary industry

Primary industry is defined as an industry that is concerned with extracting the natural resources on the earth so that they can be converted into consumable products. It can be the mining of natural resources like wood, iron, coal, minerals, agriculture industry, and even fisheries.

# Secondary industry

A secondary industry is an industry that takes raw materials as input and creates finished products as output. Heavy manufacturing, light manufacturing, food processing, oil refining, and energy generation are examples.

# Tertiary industry

The part of an industry concerned with the provision of services e.g, health care, education, plumber, insurance, transportation, hospitality, banking,

There are two type of industries  
“Manufacturing and processing” for  
secondary industry



# Manufacturing Industry

**Manufacturing industries are those that produce goods of some sort through a combination of human labor, automated equipment, chemical processing, tooling, and similar systems.**

It is the branch of industry that is concerned with using tools and machines to make a product which is to be sold

Examples are

Construction, Electronics, Semiconductor, Energy industry, Food processing, industrial design, Metalworking, Steel production, Plastics, Telecommunications, Clothing industry, Transportation, Aerospace manufacturing, Automotive industry

# Processing Industry

It is the branch of industry that is concerned with the making of formulas and manufacturing recipes

Examples are

Food and beverages

Paints and coatings

Cosmetics ,Pharmaceuticals

# Further classification of industries of both types.

1. Cottage industry
2. Small scale
3. Large scale

- **COTTAGE**

This is a type of industry where 1-5 employees are involved (family members) and fixed assets do not exceed from Rs 1-2 lakh (0.1-0.2 million). They include potter making, furniture, carpet making, embroidery etc. They are labour intensive with little use of machinery. Local skills along with locally available raw materials are utilized

- **SMALL SCALE**

These are industries which employ 10-50 workers. Their fixed assets don't exceed 10 million rupees. They are labour intensive with limited use of machinery. Some of the raw materials may be brought from nearby cities

- **LARGE SCALE**

These are industries which employ more than 300 workers (large number of workers) and their fixed assets exceed 100 million rupees (high capital input). They use many machines and the products are produced in large amounts. Land requirements are big too



# Difference between small and cottage industry

Cottage industries are like small businesses run from home or a tiny workshop, where families or a small group of people make things using basic tools. It's a bit like crafting unique items for local or special markets. On the other hand, small-scale industries are a bit bigger. They use more advanced tools and machines to make a variety of products that can reach more people. While both are small, cottage industries feel like making things at home, while small-scale industries are like a mini-factory with more technology and different things being produced

# List of industries

1. Sugar industry
2. Cement industry
3. Cotton textile industry
4. Iron and steel industry
5. Fertilizer industry
6. Oil refining industry
7. Brick industry
8. Sports good industry
9. Surgical instruments



IRON AND STEEL WORKS



OIL



SUGAR



COTTON TEXTILE



LEATHER



VEGETABLE AND GHEE



CHEMICALS



CEMENT



MACHINERY



SURGICAL  
INSTRUMENTS

# Sugar industry

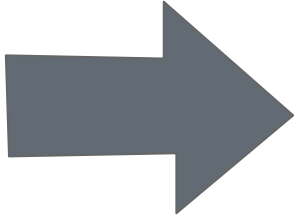
1. Sugarcane is one of the cash crops in Pakistan.
2. Pakistan's sugarcane production is 5th largest in the world
3. At the time of harvest, the cane is cut and tied in bundles and is quickly transported to sugar mills. This is so, as the sugarcane after being cut starts losing its sugar content and weight.
4. it is passed through rollers to extract the juice. The fibrous thing left behind is known as bagasse
5. Then lime is added into the juice to control pH, lime also stops decay of sucrose. Furthermore, lime also removes impurities by making them clump.
6. The mixture is left like this to allow the impurities to settle at the bottom
7. Sulphur Dioxide is passed through the juice, which bleaches many colour-forming impurities into colourless ones, so we get white sugar at end.
8. The juice (excluding impurities) is heated to 70°C to evaporate water and increase sugar percentage. This process is repeated until colour changes from thin yellow to dark brown.
9. This syrup is further concentrated under vacuum until it becomes supersaturated, and then seeded with crystalline sugar.
10. On cooling, more sugar crystallizes from the syrup.
11. This thick liquid is spun in a centrifuge to separate the white sugar crystals from the brown syrup.

The remaining product is called molasses. It has a low sugar content and further extraction of sugar from it is uneconomic

1. Bagasse (fibrous material) is often used as a primary fuel source for sugar mills. It produces sufficient heat energy to supply all the needs of a typical sugar mill, with energy to spare which is sold.
2. Bagasse is used to make disposable food containers, replacing materials such as Styrofoam, which is regarded as polluting.
3. Bagasse is also used to make paper and is also made into cattle feed whereby it is mixed with molasses
4. Molasses (black liquid) is also used for making yeast and spirits. It also relieves constipation etc

The majority of the sugar produced is for local consumption and little is exported

Bagasse (/bə'gæs/ bə-GAS) is the dry pulpy fibrous material that remains after crushing sugarcane. It is used as a biofuel for the production of heat, energy, and electricity, and in the manufacture of pulp and building materials.



# Cement industry

1. Raw materials for making cement are **limestone, clay and sand.**
2. All of these after quarrying/mining are sent to the cement factories.
3. These factories are located near to
4. limestone sources as to limestone is bulky and expensive to carry over long distances.
- 5.

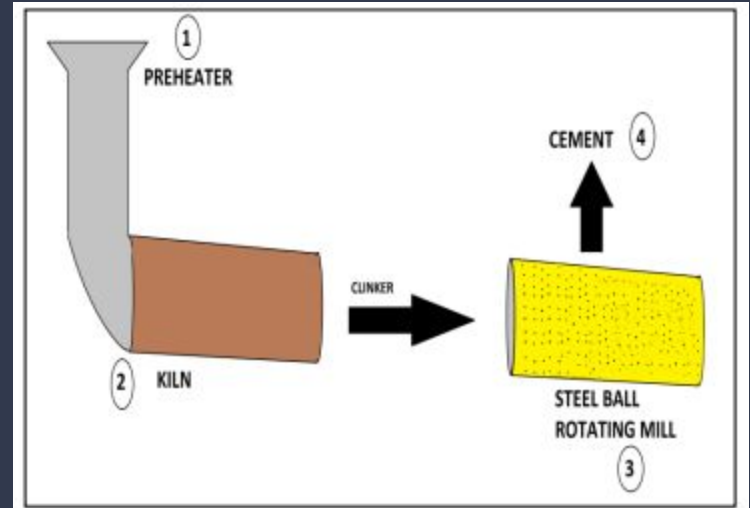


5. *the limestone, clay and sand enter a crusher, where their size is reduced to size of a small rock.*

6. The mixture is then analyzed into different labs and adjusted for proper percentage for different components

7. It is then grinded even finer into powdered form by wheel

8. It is then sent to preheater tower and then kiln. The kiln is a rotating drum which is attached to the preheating tower and slopes gently towards the ground. At the end of kiln we have a heat source such as coal or natural gas



1700°C temperatures change the powder into a new substance called clinker, which is in the form of pellets etc. The clinker is then broken down into cement powder. A small amount of gypsum is added to control the rate of setting of cement

Majority of cement produced is for local consumption, although exports are gradually increasing.

Cement is used to make factory walls, build walls of dams, line canals, build homes etc. Furthermore, structures made from cement and bricks are much more robust than structures made from wood etc.

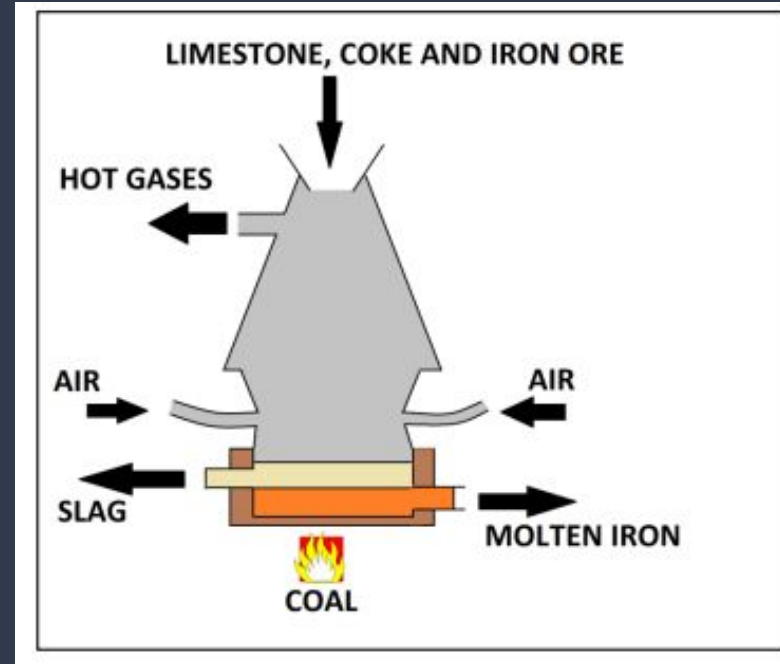


# Cotton textile

1. **After picking, the seed cotton is sent to ginning mills, here it is dried to reduce moisture and the dust etc is removed**
2. The lint is separated from the seed by rotating saws, which don't allow the seeds to go through them. ***The lint is packed into bales, while the seeds are sent to Vegetable and Ghee industries***
3. ***The bales are sent to textile mills, where fibres from different bales are twisted and turned (spinning) together by computer controlled machines to achieve uniform thickness of fibre etc. This produces yarn.***
4. Sheets, pillow cases, shirts, bed lining etc all are made from this finished cotton cloth
5. ***Seed is washed and then passed through rollers. Thus, cotton seed oil is expelled leaving behind the cotton seed cake.***
6. The oil is used to make cooking oil or margarine etc The cake is used for dairy animal feed or even as fertilizer for crops
7. Most of the cotton cloth is exported as it's sufficient to meet local demand. Cotton is only grown in some countries but it is used in many countries for many different products (yarn, cloth etc). Pakistani cotton is of good quality and sells at competitive prices
- 8.

# Iron and steel industry

1. The iron and steel industry requires 5 major components;
2. **coke** (very pure carbon, which is a very processed form of coal), **limestone**, iron ore and fuel (mostly coal).
3. Water in huge amounts
4. **Manganese and chromite** (to make stainless steel)
5. Coke, limestone and iron ore are put into a blast furnace. Here the intense heat causes decomposition of the limestone.
6. The **carbon monoxide gas is produced which reduces iron ore into molten pig iron around 96% pure**. After further purification of the iron, carbon and other metals are added to form different types of steel.
7. This is done as iron is much reactive and softer than steel, so iron must be converted to steel
8. When the steel solidifies, it is either sent in this form north to cities like Lahore etc. Here we have the Heavy Industry Complex at Taxila, which makes heavy machinery.
9. In Punjab, we have a big and increasing population with increasing demand of steel for buildings, bridges etc



Or at the steel mill it is cast into

1. Billets
2. Hot and Cold rolled coils/sheets
3. Galvanized rolled sheets
4. Blooms,
5. Ingots
6. Slabs

These products are at times exported to countries like China, UAE, Saudi Arabia, Romania, and Bangladesh. Although raw materials for making iron and steel are mostly imported

# Fertilizer Industry

1. The fertilizer industry basically requires two materials, **nitrogen and hydrogen**. *Phosphorous and potash may also be required.*
2. Nitrogen is obtained by liquid distillation of air;
3. Hydrogen is obtained by reacting methane with steam (water). For the purpose of methane supply, fertilizer factories are found close to gas pipelines in Pakistan and near sources of water.
4. These factories are also present near markets, where the demand is high. The distances are small, so transport costs are low, and the demand can be met quickly
5. Nitrogen and hydrogen are reacted to form ammonia, which is further reacted to form ammonium nitrate, urea, ammonium phosphate etc. Other minerals like phosphorous and calcium are added to have a balanced nutrient requirement for different crops
6. Fertilizers are imported from Middle East to fulfil the majority of the demand for fertilizer in Pakistan. Most of the factories are located in Punjab to meet the demands of growing population there. Also, a gas pipeline network exists in Punjab.

# fertiliser

The flow of the Indus River in the Indus Plains has decreased a lot recently due to dam construction. So the river doesn't flood its banks much often and fresh alluvium is not laid much around its banks. Thus, **fertilizers are required to fill the deficiency of minerals left in the soil**, as they have been utilized by the previous crop. Desert soils are now being used for growing crops (Thal desert), where the sand dunes have been flattened and canals made. But these desert soils are very porous, so the minerals are quickly leached out of the topsoil. Thus more and more fertilizers are required



1. Pakistan has 5 major oil refineries.
2. 2 are located in Karachi (Indus Refinery and Pakistan Refinery),
3. 1 in Hab district of Balochistan
4. one in Attock (Attock Oil Refinery)
5. And the **mid country refinery at Mehmood Kot.**

Pakistan imports the majority of its oil requirements. They are refined at coastal refineries and sent inland for further processing etc

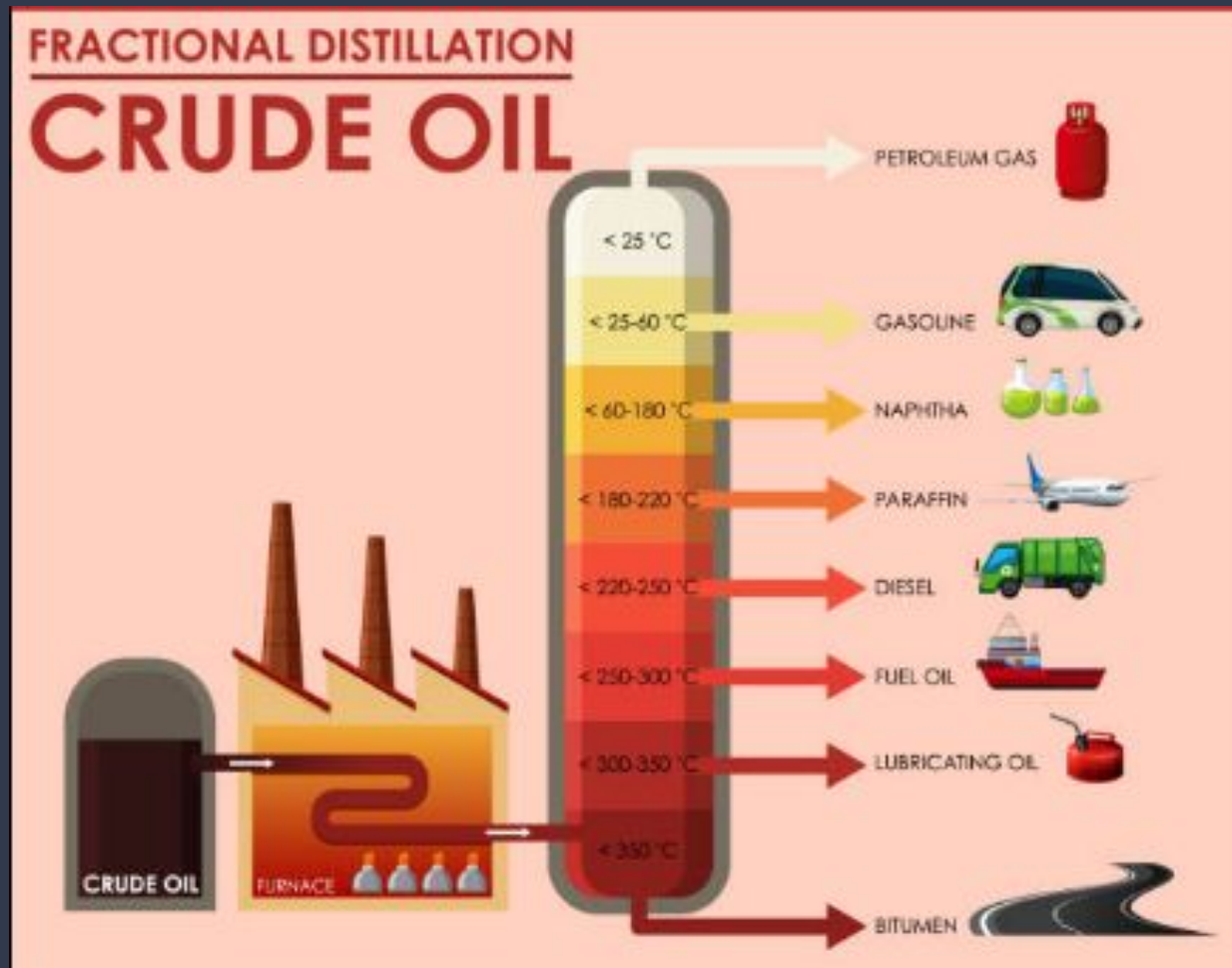
# Oil refining

Oil is refined by heating and boiling all of its components, which are then gradually cooled, the components which have a lower boiling point settle in the top halves of the boiling tower, while the heavier and higher boiling point components settle near the bottom,

1. Petroleum gas like propane is used for combustion.
2. **Naphtha is used to make chemicals and plastics.**
3. Petrol is used by automobiles.
4. **Kerosene is used as jet fuel.**
5. Diesel oil is used as fuel by cars, trucks etc.
6. Lubricating oils are used to make lubricants.
7. Fuel oil is used as fuel by ships. and asphalt is used to make roads.
8. Most of crude oil is imported, while very low quantities of refined oil is imported

# Fractional distillation of oil

The crude is heated by a furnace and is sent to a distillation tower, where it is separated by boiling point. Then the material is converted by heating, pressure or a catalyst into finished products including fuels like gasoline and diesel, and specialty products like asphalt and solvents.



# Sports good industry

Sialkot is the major foci of sport goods production in the world. It accounts for around 40% of world football production accounting for some \$200 million exports annually

Raw materials for making footballs are leather, stitches, yarn and glue. Furthermore, things like bats, hockeys etc all are made. These require wood, nails and polish/paint

## Brick Industry

To make bricks, raw clay along with 30% sand and water (amount varying due to choice) is put into steel moulds. They are compressed

and then put into a brick kiln at around 900°C. The fuel is in Pakistan coal. Most of coal produced in Pakistan is used this way. A series of chemical reactions take place thus changing the chemical structure of the mud and makes it hard

Majority of bricks made are used locally for construction, canal lining etc



# Brick industry effects on environment.

*The heavy smoke particles containing CO<sub>2</sub>, SO<sub>2</sub>, smoke, dust, nitrogen oxide and other harmful gases lead to air pollution and further leading to environmental hazards such as acid rain, global warming and ozone depletion.*

- 1. Acid rain and Ozone depletion results into health hazards and diseases such as skin cancer, eye diseases, Asthma, deafness (from noise)*
- 2. The trees are cut down in order to obtain wood required to burn bricks. This results in heavy deforestation and it makes the soil infertile*
- 3. The waste is being dumped into rivers and it has lead to water pollution with many marine species in danger.*
- 4. Agricultural land is reducing in the areas near brick kiln fields. Also causing land pollution.*

# Surgical instruments

Sialkot also is famous for its surgical instruments, whose export in 2008-2009 was around \$250 million. These instruments are made mainly in small workshops which employ many thousands of people. The quality of these instruments is strictly monitored

Most of production is exported due to modest local demand but demand from countries like UK and Germany etc is high

However, it must be noted that in western societies there has been a growing concern about the use of child labour (unethical), exploited labour (low wage) and poor worker conditions (poor sanitary conditions, hot environment) in which these instruments are made. This has forced some firms to stop orders from contractors in Pakistan. The raw materials required for making surgical instruments are **titanium, iron, chromium and nickel**



# Advantages and disadvantages.

## Advantages

- ✓ Employment opportunities for many thousands can be generated, which increases their standard of living and contributes more to the GDP
- ✓ Things like steel can be produced locally in large quantities, which is cheaper than imported steel for locals. This can help to fuel industrialization (building factories, dam, railways etc)
- ✓ Exports can be increased, which increases foreign exchange reserves. They are used to pay off foreign loans, if a country defaults in these payments it could risk a trade embargo from the countries it owes money to
- ✓ Foreign dependence on certain goods like iron and steel can be dramatically reduced; allowing for greater independence in foreign affairs. This is because your country would not be influenced by the demands of another country

## Disadvantages

- ✓ Air pollution may occur due to exhaust from chimneys and also traffic congestion near the factory may also be of concern. Traffic may consist of trucks bringing in raw materials or taking out products and bringing them to markets
- ✓ Water pollution may also occur if raw untreated waste is dumped. This will mean that the sewage enters the water table and possibly the human food chain and can cause things like cancer
- ✓ Roads may be damaged as they are used more than their capacity with trucks carrying heavy loads most of the time
- ✓ Also, lands may be cleared to make new roads and industrial centres. This will result in deforestation and soil erosion
- ✓ If industries are set up excessively in urban areas then it may cause rural-urban migration (as government will be diverting funds from development of rural areas towards maintenance of urban areas)



# Problems faced by cottage industry

1. Finance management is extremely important for people who set up these cottage industries as their working capital is low. It means that they have less money at their immediate disposal to buy raw materials etc. **They require some some financial support from the government**
2. The goods produced usually do not meet specific quality requirements thus the first batch of goods may be of excellent quality but other batch may be of poor quality and hence loss of demand and customers
3. Marketing is expensive and nearly impossible for the cottage industry owner
4. Producers in this sector often purchase goods in small quantities, thus they cannot benefit from the economies of scale, which the big companies enjoy when they buy raw materials in bulk. Thus, the cost of producing a single unit can be high
5. The raw materials available in that specific area might be of poor quality, leaving the cottage industry with a dire choice of either using them or facing bankruptcy,
6. These cottage industries are mostly labour intensive and have little or low reliance on expensive machines.
7. On the other hand, a skilled cottage industry worker takes years to master the art of making a specific object

# Requirements for setting up and industry

## LOCATION

### *Site requirements*

Land must be cheap. This will mean that cost of setting up industry will be low and will encourage investors to invest

Land must be abundant so if the owners want to expand their existing businesses they can easily do so

The land must be well drained so during times of heavy rainfall the factory isn't flooded and production isn't stopped

### *Transport Infrastructure*

Bulky, cheap and quick transport of both raw materials and product is available. This will mean that the per unit cost of making a product and transporting it (to the market) are low. This gives the company a pricing edge over its competitors. This will increase the profits of a company

# HUMAN

<i>Market access</i>	<p>A large demand for goods produced is present nearby. Nearness to the market reduces the cost of transport. If a large market is present, then the company can make bigger profits due to economies of scale</p> <p>The demand is stable and not volatile, so it doesn't vary throughout the year. This means that the company will have sales throughout the year and will have money throughout the year to pay its creditors/ contractors</p>
<i>Raw materials</i>	<p>Stable supply of raw material is present; so the company can order supplies if it faces high demand. This will improve the company's image of a reliable source of products and will help improve sales</p> <p>Large amount of cheap raw material is available near to the factory. Nearness reduces chances of accidents and reduces cost of transport. This will mean that per unit cost of product is low, giving the company a pricing edge over its competitors. This will increase the profits of a company</p>
<i>Labour</i>	<p>A large pool of skilled and unskilled labour is required, which needs little or no further training. This reduces induction costs and time; leading to smoother operations</p>

**Skilled labour is required to install and operate machines, do managerial work etc. Unskilled labour is required for driving trucks (transporting raw materials and products) etc**

*Power*

Cheap source of power is available, which means that the per unit cost of making a product is low, giving the company a pricing edge over its competitors. This will increase the profits of a company.

The sources of power must be reliable so machines aren't damaged due to sudden spike in voltage etc

*Capital*

Cheap (interest free loans are the best) sources of capital are available from either the state or private banks. This will allow the business to invest in fixed assets etc. The timeframe for making payments must be wide, so giving a business some breathing space. Loans must be easy to get with no strict conditions for getting a loan, so people are encouraged to invest in their businesses

These assets require a lot of capital to set up, but their benefits are long lasting. **They include land, telecommunications, power/gas/water supply (cleaning, cooling, drinking etc) and machinery (cheaper than labour, more accurate, quick and sturdy)**



<i>Communication</i>	Cheap communication services must be available. These link the customer and the producer, which is essential to the success of a business
<i>Government Policy</i>	Does the government provide any subsidies etc which are beneficial to an industry? Explained later under “ <b>GOVERNMENT POLICIES</b> ”

### Requirements for setting up an industry

1. Labour
2. Location and infrastructure
3. Capital
4. Communication
5. Power
6. Market access
7. Raw materials
8. Government policy

# Government policies

Industrial estates  
Export processing zones

These are future centres of industry, which are located near major cities. The government actually buys the land and plans the estate.

The government builds facilities like railways, roads, electricity, communications etc. A residential area for families of workers is also planned along with schools and hospitals etc. Access to a dry port may also be provided

Cheap loans are also provided for people to invest. For this very purpose the government invites people to invest through advertisements etc. Investors then make 20-30% payment of plots etc (getting control of land in 2-3 years after completion of industrial estate).

## Advantages of Industrial Estates

- The concentration of high pressure gas pipelines, sewage lines, water pipes etc; which satisfy demands of industry reduces the overall cost of laying down infrastructure
- Tax holidays and concessions are granted by the government which tremendously help industries as they have more money to re-invest in their businesses. This also means that government can provide these benefits to businesses located in a not so developed area. This will provide employment and generally raise standard of living of people there. Thus regional disparity is reduced
- Also, separate areas are assigned for industries. These don't overlap with residential areas, thus, environmental impact of pollution from these industries is reduced

## List of Industrial estates in Pakistan

- Karachi
- Lahore
- Gujranwala
- Jhelum
- Gujrat
- Hyderabad
- Peshawar
- Chakwal
- Daska etc

## ❖ EXPORT PROCESSING ZONES

These are places where goods are produced only for exports. There is no tax on imports and exports. Thus trade barriers like quotas and tariffs are all eliminated. High quality standard of goods are maintained (**essential**)

The government builds the entire infrastructure like roads, railways, electricity, gas and water etc

### List of EPZs in Pakistan

- Karachi
- Risalpur
- Sialkot
- Gujranwala

# Advantages of export processing zones

1. Exports Increase significantly , helping to pay off debts and reduce burden of loans
2. Technology is brought to a country as foreign investors invest in a country
3. Local workforce is trained to use machines and advanced technology
4. Increased employment
5. For workers, better working conditions, pay and hours
6. The government can help in advertisement of the products, which are shown off during international trade exhibitions

## ❖ SPECIAL INDUSTRIAL ZONES

Special industrial zones are specific areas which the government outlines as special zones. They are located in undeveloped areas. Here, the government does not develop any infrastructure but serves as the intermediate between infrastructure developing companies and SEZ companies. The government gives huge tax benefits to SEZ companies who invest there. For example a 5 year no tax agreement can be granted

The SEZ companies develop their own infrastructure by contracts with infrastructure developing companies. This infrastructure is also used by the local people. Thus, employment and a better living standard is guaranteed

## List of SEZs in Pakistan

- Pindi Bhattian, Punjab
- Hyderabad, Punjab
- Hattar, Khyber-Pakhtunkhwa

FORMAL

INFORMAL



Regular Pay



Irregular Earning



Employed by an employee



Self Employee

# Sectors of Industries





Quality of goods is maintained



No standard quality of goods



Regular Working hours



Irregular Working hours



Tax payments and pension schemes along with insurance benefits



No taxes paid, no insurance and pension schemes



# DEFINITIONS

## Raw Material

- ✓ The basic material from which a product is made.

## Refined

- ✓ Impurities or unwanted elements having been removed by processing.

## Processed

- ✓ Perform a series of mechanical or chemical operations on (something) in order to change or preserve it.

## Manufactured

- ✓ Produced on a large scale using machinery.

## Value Added

- ✓ The addition of features to a basic line or model for which the buyer is prepared to pay extra.

### 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

**The End**

