

# ***MINERALS***

## Primary Industry

- These are those in which raw materials (minerals) are obtained from the Earth/ground.
- For example: Fishing, Farming, Forestry, etc.

## Renewable resources

- They can be re-used e.g. Wind, water, sunlight, etc.

## Non-renewable resources

- They exhaust once used e.g. Minerals, fossil fuels, etc. Therefore, minerals are non-renewable resources.

# Mineral Types

## Metallic

They are those minerals which resemble metals and have characteristics of metals. For example, they are shiny, hard and smooth. They are good conductors of heat and electricity. They can be molded into other shapes. Examples are: Chromite, Iron ore, Copper, Bauxite, etc.

## Non-Metallic

They do not resemble metals and their characteristics are opposite to them. For example, they are soft, dull and rough. They are poor conductors of heat and electricity. They cannot be reshaped. Main non-metallic (Pakistani) minerals are: Limestone, Gypsum, Rock Salt, Mineral Oil, Marble, Coal, Natural Gas, etc.

# Importance

- They contribute to GDP/GNP (Gross National Product) and therefore to national income.
- They are raw material for different industries like limestone is used for cement industry, gypsum is used in fertilizer industry and coal and iron is used in steel industry.
- Some are exported like marble and rock salt and thus earn foreign exchange which helps to improve Balance of Payment or Balance Of Trade.
- They are locally produced. Thus, they restrict imports and save foreign exchange.
- They reduce rural to urban migration as most minerals are found in those areas and when people get jobs in mines there, they don't migrate to cities.
- They are a source of employment for miners, and for those who work in such industries which use minerals as raw materials.
- They help to develop remote areas as they are mostly found in for-flung places and so the government provides infrastructure to some areas which also helps to improve the standard of living for the people living there.
- They attract foreign investment for exploration and exploitation.

## Problems

- Lack of capital so modern machinery cannot be exchanged.
- Lack of exports due to high illiteracy in Pakistan. Thus, it is difficult to explore and exploit minerals.
  - Therefore, the government has to import foreign experts which adversely/negative affects Balance of Payment as they are paid in foreign currency.

- Lack of government attention/low priority given by the government thus slow development.
- Inaccessible mineral deposits due to high mountains and steep slopes, etc, which makes it difficult to extract minerals.
- There is institutional mismanagement which leads to corruption and therefore the budget for the development of mining goes elsewhere.
- Terrorism/lack of security thus foreign investors are reluctant to invest.

## Solutions

- Many institutions have been setup e.g. Geological Survey of Pakistan for investigation and mapping of minerals.
- Incentive for foreign and local investors e.g. Tax exemption on import of machinery.
- Attracted multi-national to explore minerals by offering them share in production.
- Improvement in education sector for producing skilled labor e.g. more engineering colleges and universities as mining needs more engineering skills.

## Main minerals of Pakistan and their uses

### Non-Metallic

#### Limestone

- Used in Fertilizer industry
- It is painted on trunks of fruit trees to protect them from insect attacks.
- Main raw material for cement industry.
- It is used as flux in iron and steel industry.
- Used to reduce acidity of soil.

#### Rock Salt

Preservative uses:

- Food making industry
- Cooking
- Used in making sodas, soda ash, carbonates and bicarbonates of soda and Caustic soda.

Other uses:

- Textile industry.
- Laundries as detergent
- Leather (Tanning) industry.

#### Gypsum

- Fertilizer, paints, rubber, paper, Plaster of Paris and cement.

#### Marble

- Flooring
- Decorative pieces

#### Sulphur

- Fertilizers, explosives and chemical industry.

## Clays

- |                     |   |                            |
|---------------------|---|----------------------------|
| (I) China Clay      | - | Cement                     |
| (ii) Fire Clay      | - | Bricks, pottery, chemicals |
| (iii) Fullers Earth | - | Steel                      |

## Brine

It is not a mineral, but a mixture of rock salt and water.

- It is used in fertilizers.

# Metallic minerals

## Chromite

- Used in making bridge materials
- Stainless steel
- Railway carriages

## Bauxite

- Used in making tins, cans and utensils

## Copper

- Copper wires, switches
- Electrical appliances

## Iron Ore

- Steel making industry

# Areas

**Limestone:** Mangopfir, Ganjo Takkar, Murli Hills, Daudkhel, Potowar Plateau

**Rock Salt:** Salt range (Khewra, Warcho), Kala Bagh

**Gypsum:** Dandot, Khewra, Daudkhel

**Sulphur:** Koh – e – Sultan

**China Clay:** Shah Deri (District Swat)

**Fire Clay:** Salt Range

**Fuller's Earth:** Sulaiman Range

**Chromite:** Muslim Bagh (Near Quetta)

**Copper:** Saindak (North – Western Balochistan)

**Bauxite:** Muzaffarabad

**Iron Ore:** Kalabagh

**Marble:** Mardan, Swat

## Limestone

It is bulky so difficult to transport

- It is low priced so expensive to transport
- Cement industries are established closer to limestone as it is their main raw material
- Railway is cheapest for its transport

## Limestone Quarrying

- When limestone outcrops on the surface.
- It is extracted by open excavation.
- Hand tools like hammers, drills, etc, are mostly used.
- Other equipment like explosives and power saws are also used if required.

## Effects of Mining on Environment

- **Noise pollution** – by blasting + noise of machinery which may cause deafness.
- **Land pollution** – due to deformation/waste disposal/deforestation/ land cannot be effectively used in, for example, agriculture.
- Causes flooding and soil erosion.
- **Water pollution** – poor waste disposal, water contaminated so not fit for human consumption. Diseases like cholera and hepatitis is caused.
- **Air pollution** – Due to smoke or dust causing turbinosis and lung cancer.

## Protection

- Scientific equipment for efficiency so less water disposal.
- Treatment of disposal/waste to avoid its harmful effects.
- Water treatment plants be installed for clean water for mines.
- Green trees should be planted to reduce air pollution and deforestation.
- Protective clothing and masks for miners.
- Land must be leveled after completion of mining for better use in future.
- Strict implementation of environmental laws to avoid air and water pollution.

## Advantages & Disadvantages of developing mining industry in Pakistan

### Advantages

- More employment
- More exports e.g. Marble and rock salts
- More foreign exchange which improves Balance Of Trade.
- Imports will be restricted as Pakistan will be self-sufficient in many minerals like limestone.
- Better telecommunications e.g. better roads and telecommunications in Balochistan.
- More education by teaching skills as mining industry needs engineering skills.
- More technology like modern machinery for mining/drilling, etc.
- Growth of cement-based industries e.g. Glass and steel industry.

### Disadvantages

- Lack of skilled labor due to low literacy in Pakistan
- Technology – costs money and is mostly imported, which means foreign exchange will be spent and negatively effects in Pakistan's economy.
- Mining causes different types of pollutions (water, land, noise, etc)
- Pakistan may still have to import minerals like coal due to poor quality in Pakistan
- Investment problem :-
  - Shortage as Pakistan is a developing country.
  - May go elsewhere due to corruption.
  - May lead to shortage of funds for other sectors like agriculture.

- Minerals are non-renewable as they will run out.