CBSE Notes Class 8 Social Science Geography Chapter 3

Mineral and Power Resources

A naturally occurring substance with a definite chemical composition is a mineral and they are not evenly distributed over space. Minerals are concentrated in a particular area or rock formations. A few of these minerals are found in areas, which are not easily accessible such as the Arctic Ocean bed and Antarctica. Minerals are also formed in several types of geological environments, under varying conditions. They are created by natural processes without any human interference. They can be identified on the basis of their physical properties such as colour, density, hardness and chemical property such as solubility.

Types of Minerals

There are 3000 various types of Minerals and based on their composition, they can be classified into metallic and non-metallic minerals.

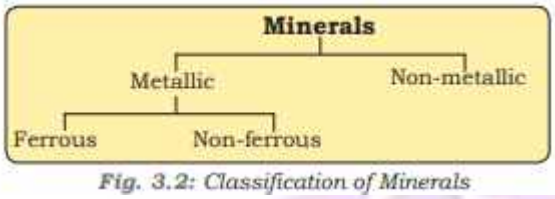

Fig. 3.2: Classification of Minerals

Metallic minerals contain metal in the raw form. Metals are hard substances that conduct heat and electricity and have a characteristic lustre or shine. Iron ore, bauxite, manganese ore are some examples. Metallic minerals may be ferrous or non-ferrous. Ferrous minerals like iron ore, manganese and chromites contain iron. A non-ferrous mineral does not contain iron but may contain some other metal such as gold, silver, copper or lead.

Non-metallic minerals do not contain metals. Limestone, mica and gypsum are examples of such minerals. The mineral fuels like coal and petroleum are also non-metallic minerals. Minerals can be extracted by mining, drilling or quarrying.

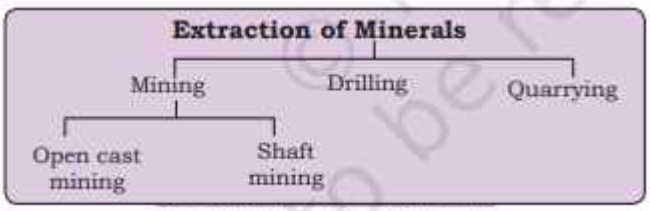

Fig. 3.3: Extraction of Minerals

Mining is the process of extracting minerals from rocks buried under the earth's surface. Meanwhile, in open-case mining, minerals that lie at shallow depths are extracted by removing the surface layer. At the same time, Shaft mining is the method in which deep bores, called shafts, are made to reach mineral deposits that lie at great depths. Also, drilling is the method used to bore deep wells so as to take out Petroleum and Natural gas that occur far below the earth's surface. Finally, in the method known as quarrying, minerals that lie near the surface are just dug out.

Distribution of Minerals

Types of Minerals	Rock Formations	Examples
Metallic minerals	Igneous and metamorphic rock formations	Iron-ore in north Sweden, copper and nickel deposits in Ontario, Canada; iron, nickel, chromites and platinum in South Africa are examples of minerals
Non-Metallic Minerals	Sedimentary rock formation	Limestone deposits of Caucasus region of France, manganese deposits of Georgia and Ukraine and phosphate beds of Algeria. Mineral fuels such as coal and petroleum are also found in the sedimentary strata

Asia

- **Large iron ore deposits**-China & India
- **World's largest tin producer**-China, Malaysia and Indonesia
- **Production of lead, antimony and tungsten**-China leads
- **Deposits of manganese, bauxite, nickel, zinc and copper**-Asia

Europe

- **Leading producer of iron ore in the world**- Europe
- **Countries with large deposits of iron ore**- Russia, Ukraine, Sweden and France
- **Minerals deposits of copper, lead, zinc, manganese and nickel**- Eastern Europe and European Russia

North America

- **Mineral deposits in North America are located in 3 zones**- the Canadian region north of the Great Lakes, the Appalachian region and the mountain ranges of the west
- **Iron ore, nickel, gold, uranium and copper**- mined in the Canadian Shield Region

- **Coal**- Appalachian Region
- **Vast deposits of copper, lead, zinc, gold and silver**- in Western Cordilleras

South America

- **The largest producer of high-grade iron ore in the World**- Brazil
- **Leading producers of copper**-Chile and Peru
- **World's largest producers of tin**-Brazil and Bolivia
- **Large deposits of gold, silver, zinc, chromium, manganese, bauxite, mica, platinum, asbestos and diamond**-South America
- **Mineral oil is found**-in Venezuela, Argentina, Chile, Peru and Columbia

Africa

Rich in mineral resources-World's largest producer of diamonds, gold and platinum

- **Produce a large portion of the world's gold**-South Africa, Zimbabwe and Zaire
- **Copper, iron ore, chromium, uranium, cobalt and bauxite**-other minerals found in Africa
- **Oil**- found in Nigeria, Libya and Angola

Australia

The largest producer of bauxite in the world-leading producer of gold, diamond, iron ore, tin and nickel-rich in copper, lead, zinc and manganese

- **The largest deposits of gold**- found in Kalgoorlie and Coolgardie areas of western Australia

Antarctica

Variety of mineral deposits are found, some probably large.

- **The significant size of deposits of coal-** the Transantarctic Mountains
- **Deposits of Iron forecasted**-near the Prince Charles Mountains of East Antarctica
- **Iron ore, gold, silver and oil present** in commercial quantities

Uses of Minerals

- Minerals for gems-hard set in various jewellery styles
- Copper used in making coins and pipes.
- Silicon used in the computer industry is obtained from quartz
- Aluminium extracted from its ore bauxite is used in automobiles and aeroplanes, bottling industry, buildings and kitchen cookware.

Conserving Minerals

Minerals- a nonrenewable resource takes thousands of years for the formation and concentration of minerals. The rate of formation is much smaller than the rate at which humans consume these minerals.

It is necessary to reduce wastage in the process of mining. Recycling of metals is another way to conserve mineral resources.

Power Resources

Power or energy plays a vital role in our lives. We also need power for industry, agriculture, transport, communication and defence. Power resources may be broadly categorised as conventional and non-conventional resources.

Conventional Sources

The energy which has been in common use for a long time-examples are firewood and fossil fuels.

Firewood

Widely used for cooking and heating - 50% of the energy used by villagers comes from firewood. Remains of plants and animals which were buried under the earth for millions of years got converted by the heat and pressure into fossil fuels. Fossil fuel such as coal, petroleum and natural gas are the main sources of conventional energy. The rate at which the growing world population is consuming them is far greater than the rate of their formation. So, these are likely to be exhausted soon.

Coal

Abundantly found fossil fuel- used as a domestic fuel, in industries such as iron and steel, steam engines- to generate electricity. Electricity from coal is called thermal power. The coal was formed millions of years ago when giant ferns and swamps got buried under the layers of earth. Coal is therefore referred to as Buried Sunshine. The leading coal producers of the world are China, USA, Germany, Russia, South Africa and France. The coal producing areas of India are Raniganj, Jharia, Dhanbad and Bokaro in Jharkhand.

Petroleum

Petrol keeps your car running-Oil keeps your cycle from squeaking-both begin as thick black liquid called petroleum. found between the layers of rocks- drilled from oil fields located in off-shore and coastal areas-sent to refineries which process the crude oil and produce a variety of products like diesel, petrol, kerosene, wax, plastics and lubricants. Petroleum and its derivatives are called Black Gold, which are very valuable.

Chief petroleum producing countries- Iran, Iraq, Saudi Arabia and Qatar, other major producers are USA, Russia, Venezuela, and Algeria.
Leading producers in India-Digboi in Assam, Bombay High in Mumbai and the deltas of Krishna and Godavari rivers.

Natural Gas

Found with petroleum deposits-released when crude oil is brought to the surface-used as a domestic and industrial fuel.
Major producers of natural gas-Russia, Norway, UK and the Netherlands - In India Jaisalmer, Krishna Godavari delta, Tripura and some areas offshore in Mumbai have natural gas resources.

Cause for concern-Sharp increase in our consumption of fossil fuels has led to their depletion at an alarming rate- toxic pollutants are released from burning these fuels- Unchecked burning of fossil fuel is like an unchecked dripping tap which will eventually run dry. This has led to the tapping of various nonconventional sources of energy that are cleaner alternatives to fossil fuels.

Hydel Power

Rain water or river water stored in dams. The falling water flows through pipes inside the dam over turbine blades placed at the bottom of the dam. The moving blades then turn the generator to produce electricity. This is called hydro electricity. Water discharged after the generation of electricity is used for irrigation. 1/4th of the world's electricity is produced by hydel power.

- **Leading producers of hydel power in the world**-Paraguay, Norway, Brazil, and China.
- **Important hydel power stations in India**-Bhakra Nangal, Gandhi Sagar, Nagarjunsagar and Damodar valley projects.

Non-conventional Sources of Energy

Increasing use of fossil fuels leads to shortage- if the present rate of consumption continues, the reserves of these fuels will get exhausted- their use also causes environmental pollution- Therefore, there is need for using nonconventional sources such as solar energy, wind energy, tidal energy, which are renewable.

Solar energy

Solar energy trapped from the sun-used in solar cells to produce electricity
Many of these cells are joined into solar panels to generate power for heating and lighting purposes. Solar energy is used in solar heaters, solar cookers, solar dryers besides being used for community lighting and traffic signals.

Wind energy

Inexhaustible source of energy- Windmills are used for grinding grain and lifting water-high speed winds rotate the windmill which is connected to a generator to produce electricity- Wind Farms are found in Netherlands, Germany, Denmark, UK, USA and Spain.

Nuclear Power

Obtained from energy stored in the nuclei of atoms of naturally occurring radioactive elements like uranium and thorium- undergo nuclear fission in nuclear reactors and emit power

- **Greatest producers of nuclear power**- USA and Europe
- **Large deposits of Uranium in India**-Rajasthan and Jharkhand
- **Thorium found in large quantities-** in the Monazite sands of Kerala
- **Nuclear power stations in India**-located in Kalpakkam in Tamilnadu, Tarapur in Maharashtra, Ranapratap Sagar near Kota in Rajasthan, Narora in Uttar Pradesh and Kaiga in Karnataka.

Geo-Thermal Energy

Heat energy obtained from the earth- temperature in the interior of the earth rises steadily with depth- heat energy may surface itself in the form of hot springs- this energy is used to generate power and in the form of hot springs, it has been used for cooking, heating and bathing.

- **World's largest geothermal power plants**- in US, followed by New Zealand, Iceland, Philippines and Central America
- **Geothermal plants in India**-located in Manikaran in Himachal Pradesh and Puga Valley in Ladakh

Tidal Energy

Energy generated from tides - can be harnessed by building dams at narrow openings of the sea-During high tide, energy of the tides is used to turn the turbine installed in the dam to produce electricity.

- **Huge tidal mill farms-**Russia, France and the Gulf of Kachchh in India

Biogas

Organic waste (dead plant and animal material, animal dung and kitchen waste) can be converted into a gaseous fuel called biogas. Organic waste is decomposed by bacteria in biogas digesters- will emit biogas (a mixture of methane and carbon dioxide)-is an excellent fuel for cooking and lighting and produces huge amounts of organic manure each year- harnessing this energy is both difficult as well as costly.