Mineral and Power Resources

A mineral is termed as the naturally occurring material which possesses a definite chemical composition. There is an unequal distribution of minerals all over the world.There may be a different concentration of different minerals in a particular zone. Sometimes minerals cannot be accessed due to remote conditions. There are various types of minerals deposited in specific regions of the earth depending upon different environmental conditions. Some of these minerals are power resources which are of immense significance with respect to the industry, agriculture, transport, communication and defence. CBSE Class 8 Social Science Geography Chapter 3 focuses on these minerals, their uses and conservation procedures.

Forms of Minerals

Approximately three thousand types of minerals are found on the earth's crust.

- Minerals are divided into two categories depending upon the composition namely metallic and non-metallic.

- Raw types of metal are present in the metallic minerals. Metals are classified as hard components that carry out heat and electricity. Few examples of metallic minerals are iron ore, bauxite, manganese ore etc.
- Metallic minerals can be classified into two categories namely ferrous and non-ferrous. Examples of ferrous minerals are iron ore, manganese and chromites etc.
- If iron is absent in the minerals then it is termed as a non-ferrous mineral. There may be the presence of other metals such as gold, silver, copper etc in the non-ferrous metal.
- If there is an absence of any kind of metal then it is termed as non-metallic minerals. The examples of non-metallic minerals are limestone, mica and gypsum. Coal and petroleum are also examples of non-metallic minerals.
- Minerals can be extracted by three ways namely mining, drilling and quarrying. The process of mining can also be categorized in two ways namely open cast mining and shaft mining.

Mineral Distribution

Minerals can be found in various types of rocks. Few types of minerals can be found in igneous rocks and other kinds are found in metamorphic rocks. The other forms of minerals are found in sedimentary rocks. Normally, metallic minerals can be identified in igneous and metamorphic rocks. Non-metallic types of minerals are found in sedimentary rock formations of plains and young fold mountains. Continent wise distribution of minerals is discussed in the following:

- **Asia**: Largest iron ore deposits are identified in India and China. Half of the world's tin is produced by this continent. The world's largest tin producers are China, Malaysia and Indonesia. There are huge deposits of manganese, bauxite, nickel, zinc and copper in this continent.
- **Europe**: The countries like Russia, Ukraine, Sweden and France made Europe one of the leading producers of iron ore. There are also sufficient quanta of Zinc, copper, lead, manganese and nickel deposition in Europe.

- **North America**: North America is very rich in terms of minerals which consist of iron ore, nickel, gold, uranium and copper.
- **South America**: High-grade iron ore is largely produced in Brazil. The countries like Venezuela, Argentina, Chile, Peru, and Columbia are leaders in producing gold, silver, zinc, chromium, manganese etc.
- **Africa**: Africa is considered to be the world's largest producer of the diamond. Apart from that, gold, platinum, zinc, copper etc are adequately produced in Africa.
- **Australia**: Australia is considered to be the largest producer of bauxite in the world. There is also sufficient production of gold, diamond, iron ore, tin and nickel in this continent.
- **Antarctica:** There is a sufficiently large deposition of coal in the Transantarctic Mountains. On the other hand, there is a prediction of a large deposit of iron in the Prince Charles Mountains of East Antarctica.

Distribution of Minerals in India

- Iron: Jharkhand, Orissa, Chhattisgarh, Madhya Pradesh, Goa, Maharashtra and Karnataka.
- Bauxite: Jharkhand, Orissa, Madhya Pradesh, Gujarat, Maharashtra and Tamil Nadu.
- Mica: Bihar, Jharkhand, Rajasthan and Andhra Pradesh
- Copper: Rajasthan, Madhya Pradesh, Karnataka, Jharkhand and Andhra Pradesh
- Manganese: Madhya Pradesh, Maharashtra, Orissa, Madhya Pradesh, Rajasthan, Tamil Nadu and Gujarat
- Limestone: Jharkhand, Bihar, Madhya Pradesh, Chhattisgarh, Orissa, Gujarat and Tamil Nadu
- Gold: Karnataka
- Salt: Various seas, lakes and rocks

Uses of Minerals

- Various industries are completely dependent upon the minerals.
- Hard minerals are generally used in gems and placed in different forms of jewellery.

- From coins to pipes, every single item is made of copper.
- There is extensive use of silicon in the computer industry.
- Aluminium, obtained from bauxite is utilized in automobiles and aeroplanes, bottling industry, buildings and kitchen cookware.

Conservation of Minerals

Minerals are such resources of nature which are not renewable. Minerals are generally formed and concentrated by thousands of years. The wastage must be reduced in the mining procedure. Mineral resources can also be conserved by the process of recycling.

Power Resources

Power resources can be divided into two categories namely conventional and non-conventional resources.

Conventional Sources of energy: The resources which have been commonly used for a long time are known as conventional sources. The primary conventional energy resources are firewood and fossil fuels.

- **Firewood**: Firewood is largely used in cooking and heating. Near about 50% of the energy used by villagers in India originates from firewood.
- **Fossil fuels**: Fossil fuels are created by the conversion of remains of plants and animals buried under the earth by heat and pressure. The basic resource of conventional energy is coal, petroleum and natural gas.
- **Coal**: The most abundantly found fossil fuel in the earth crust is the coal. Coal is utilized as domestic fuels in various industries like iron and steel, steam engines and to produce electricity. Electricity generated from coal is termed as thermal power. Another name of coal is “buried sunshine” because of its formation procedure. The largest coal producers of India are Raniganj, Jharia, Dhanbad and Bokaro.
- **Petroleum**: Petroleum is identified between the layers of rocks and is drilled from oil fields situated in off-shore and coastal regions. Different types of products such as diesel, petrol, kerosene, wax, plastics and lubricants are produced by the crude oil refined from the Petroleum. It is so valuable that

it is called the Black Gold. The largest producer of Petroleum in India is Digboi in Assam. Apart from that, Bombay High in Mumbai and the Krishna and Godavari river deltas are also rich in Petroleum.

- **Natural Gas**: Natural gas can be formed in the deposits of Petroleum and is discharged at the time of bringing crude oil to the surface. It can be utilized in the form of domestic and industrial fuel. Jaisalmer, Krishna and Godavari delta etc are rich in natural gas resources.
- **Hydel Power**: The stored rainwater or river water in dams is prepared to fall from heights. The water with the help of turbine blades produces electricity. This is termed as hydroelectricity. The famous hydel power projects of India are Bhakra Nangal, Gandhi Sagar, Nagarjunsagar and Damodar Valley Corporation (DVC) projects.

Non-Conventional Sources of Energy: Fossil fuels are falling short due to their increasing usage. There is a huge possibility of conventional sources of energy getting exhausted. Another demerit of using conventional sources of energy is increasing environmental pollution. For that purpose, the

requirement of non-conventional sources of energy is realized.

- Examples of non-conventional sources of energy are as follows:
- **Solar Energy**: Source is the sun
- **Wind Energy**: Atmospheric wind is the source
- **Nuclear Energy**: Energy stored in the nuclei of atoms
- **Geothermal Energy**: Heat energy acquired from the earth
- **Tidal Energy**: Energy obtained the tides
- **Biogas**: Source of biogas is organic wastes

Important Questions and Answers

Q1. What are the various advantages and disadvantages of various conventional power resources?

Ans. Advantages of Oil:

a) Effortless transportation

b) Backbone of petrochemical industries

Disadvantages of Oil:

a) Reduction of oxygen because of oil spillage and gas outflow

b) Acid rain is caused by the release of pollutants

c) It is not an easy task to explore new fuel

Advantages of natural gas:

a) Effortless transportation

b) Natural gas is cleaner than oil and coal

c) Oil is costlier than natural gas

Advantages of Firewood:

a) Can be accessed easily

b) Energy is generated from a large number of people

Disadvantages of Firewood:

a) Collection of firewood is subject to time constraint

b) Generates pollution

c) Greenhouse effect is promoted

d) Causing deforestation

Advantages of coal:

a) Easily available

b) Easily converted into electricity

Disadvantages of coal:

a) Causes enormous pollution

b) Not so easy in transporting

Advantages of Hydel Power:

a) Not so polluting

b) Fishing and irrigation are promoted

c) Not so costlier

Disadvantages of Hydel Power:

a) Local community can be displaced

b) Establishment is very much expensive

Q2. Write a short note on Solar Energy.

Ans. We can feel the heat and light energy of the sun on a daily basis. Electricity is generated by trapping solar energy from the Sun through the solar cells. Most of the solar cells are connected with solar panels to produce

power for heating and lighting purposes. The tropical countries which are blessed with lots of sunshine realize the most of the benefits of utilizing solar energy. It is one of the best technologies to utilize the heat of the Sun. Solar energy can be utilized in solar cookers, solar heaters, and solar dryers and also utilized in lighting the community and traffic signals.

Q3. Write a short note on Nuclear Energy.

Ans. Nuclear power is generated from the energy stored in the nuclei of atoms of naturally happening radioactive elements such as uranium and thorium. The fuels go through nuclear fission in nuclear reactors and power is emitted. The USA and Europe are the largest producers of nuclear energy. Rajasthan and Jharkhand have the greatest concentration of uranium in India. In the Monazite sands of Kerala, huge quantities of Thorium can be found. The nuclear power stations of India are situated in Kalpakkam in Tamil Nadu, Tarapur in Maharashtra, Ranapratap Sagar in Kota, Rajasthan, Narora in Uttar Pradesh and Kaiga in Karnataka. It is one

of the rarest resources of non-conventional type of energy.

Q4. Write a short note on Geothermal Energy.

Ans. Geothermal Energy is generated by the heat energy acquired by the earth. If we move to the deeper portions of the earth, the temperature gradually increases in the interior of the earth. Often the above-mentioned heat energy may surface itself in the shape of hot springs. Power is generated by this heat energy. The world's largest geothermal power plant is situated in the USA. Apart from that, there are geothermal power plants situated in New Zealand, Iceland, Philippines and Central America also. Geothermal plants are situated in Manikaran in Himachal Pradesh and Puga Valley in Ladakh in India.

Q5. What do you mean by a rock?

Ans. An aggregate of one or more minerals is termed as a rock. But the composition of the components of minerals is not definite. Ores are the sources from which minerals are extracted. Ores are also forms of rocks. Out of 2800 forms of minerals that have still been found, only near about 100 are regarded as ore minerals. So it

can be said that all minerals are rocks but the vice versa is not always true. Rocks are of three types namely igneous rocks, sedimentary rocks and metamorphic rocks. The rocks and the minerals are linked together integrally.