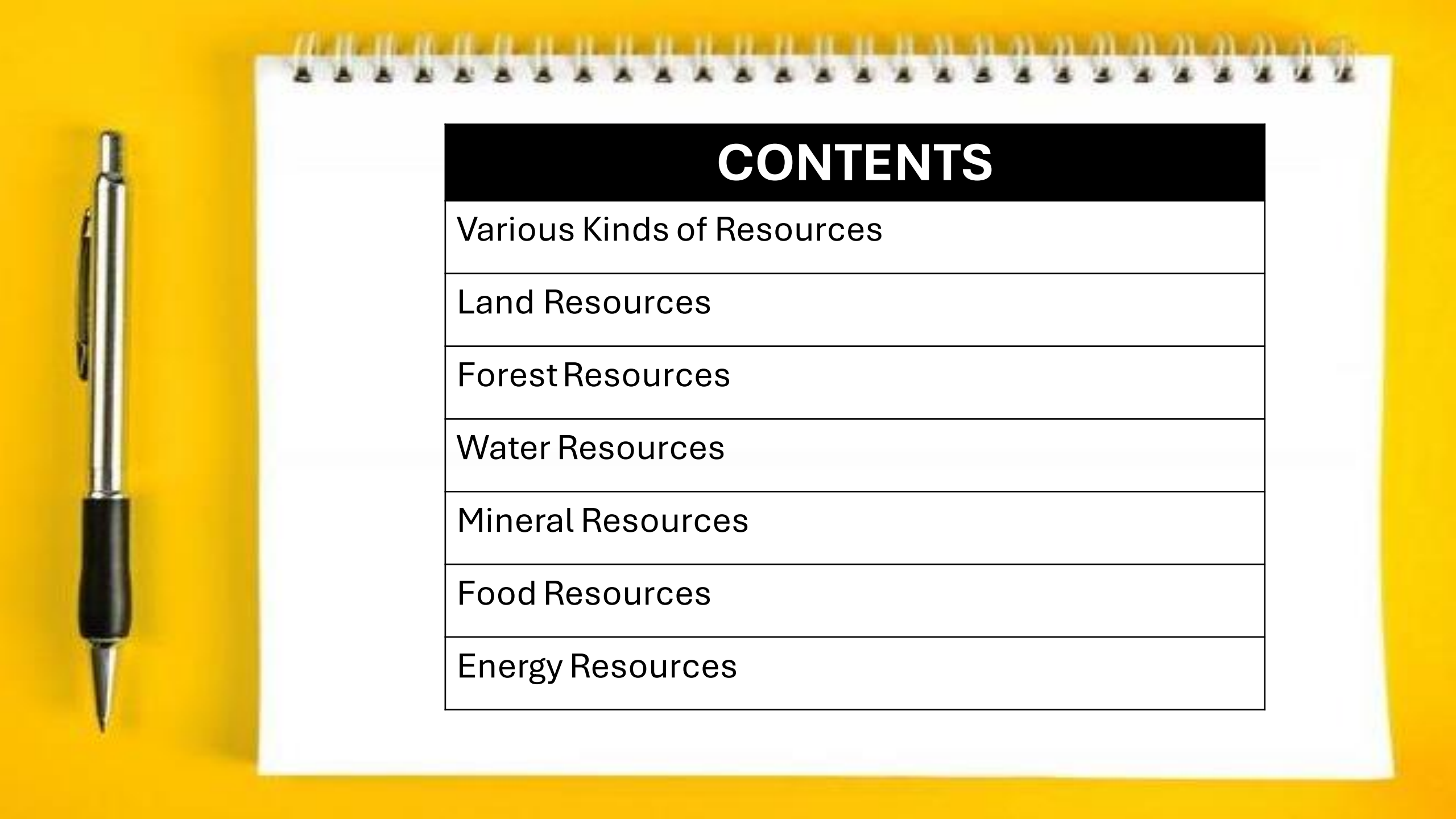
UNIT 2

NATURAL RESOURCES PROBLEMS & SOLUTIONS



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Various Kinds of Natural Resources

The following are the various kinds of resources available in nature:

i) Land Resources
ii) Forest Resources
iii) Water Resources
iv) Mineral Resources
v) Food Resources
vi) Energy Resources

(1) Land Resources

Land is one of the most important natural resources in India. Based on height variations, land surface area of the earth is classified into a number of land forms like mountains, hills, plateaus, plains and valleys. Of these land forms, riverine plains and coastal plains play a vital role in human life.

Soil is very important environmental component for human, animals, and plants. It is the basic medium for food, vegetation and natural resources. Land is highly useful to obtain the basic necessities like food, clothing, and shelter. By utilizing land, man is able to do the most important occupations like agriculture, industries, transportation, mining, cattle and sheep rearing. Hence, the role of land in the day to day affairs of man is said to be vital.

Factors Affecting Land Resources

Among the factors affecting land resources the important ones are:

(A) Soil erosion
(B) Landslides and
(C) Desertification.

(A) Soil Erosion

Soil erosion is the drifting of the top layer of the soil from one place to another. It is a natural process. Generally wind and water are responsible for soil erosion. Some man-induced factors are also responsible for soil erosion which are:

(i) Destruction of forests
(ii) Mining operations
(iii) Over-grazing of cattle leaves the land barren and makes it susceptible for soil erosion.

Effects of Soil Erosion are:

i) Floods
ii) Ardiation (drought)
iii) Reduction in crop production
iv) Disturbance in air-humidity balance

B) Landslides

A landslides is the descent of a mass of earth and rock down a mountain slope which is also a natural disaster. Soil erosion, inadequate draining of rain water and excessive pressure on waterbeds cause landslides. Landslides occur mostly in rainy season.

Constructing buildings on hill or mountain slopes preventing the free flow of rain water and laying a number of roads by levelling mountain rocks lead to landslide. By strengthening the hill slopes, landslides could be avoided. By constructing draining canals to long distances, rain and riverlet waters could be safely carried away from the hill slopes.

C) Desertification of Land

Deserts are unused land areas of the world. When a region remains without any rainfall permanently it is referred to as a desert. Selfish attitude of man and his activities like deforestation, overgrazing,etc., lead to the land becoming desert in course of time. Man is also responsible for climate changes which lead to the formation of deserts. Desertification starts from a small fertile land area. Large amount of dust particles are added to the atmosphere, leading to drought conditions. Deforestation is also responsible to the formation of desert i.e. temporary drought conditions become permanent.

Prevention of Desertification

i) In border areas of deserts, sand dunes should be prevented from advancing by growing thick vegetation.
ii) Plants may be grown in desert regions by taking water from the rivers
iii) The use of underground water near the desert region should be properly regulated, so that moisture in the sand will not be reduced to a greater extent.
iv) By controlling air pollution, rise in atmospheric temperature may be prevented thereby increasing the chances of getting more rainfall.

Meaning of Soil Fertility

Soil is the uppermost part of the earth's surface. It is a dynamic mixture of solid and dissolved mineral matter, living and dead organic matter, water and air. **Soil fertility** is the ability of the soil to supply essential nutrients to plants.

Generally, soils that have a high proportion of clay and organic matter have higher fertility. The water-holding capacity of a soil is determined by its texture. Decrease in soil fertility is referred as **'Degradation of land resources'.**

Causes for the Degradation of Land Resources

1. **Soil Erosion**: Due to soil erosion the upper layer of earth is removed resulting in depletion of nutrients in the soil.
2. **Flood and Water-logging**: Flood causes soil erosion and thereby depletion of nutrients in the soil. Water-logging causes the flushing out of minerals from the soil.
3. **Use of Chemical Fertilizers and Pesticides**: Continued use of chemical fertilizers destroys the micro organisms in the earth which leads to decrease in soil texture.
4. **Cultivation Without Crop Rotation**: When cultivating a single variety of crop, it decreases the soil fertility leading to land becoming barren. To avoid this, crop rotation must be adopted.

Conservation of Soil

Soil conservation means the prevention of wastage of soil and depletion of earth.
Some conservational methods are as under:

(1) **Reforestation**: Reforestation means planting of trees which are quick-growing and provide efficient plant cover for prevention of soil erosion.

(2) **Agronomic methods:** These include

(a) Contour planting at right angles to the slopes to check flow of water down the hills.
(b) Contour furrowing: Furrows should be made on slopes to hold the run off water and soil.
(d) Mulching: Plants and animals are not burnt but after decomposition used as humus.
(e) Lay farming: Crop-grass rotation in agriculture is called lay farming.

(3) **Terracing**: Terracing means the division of sloppy areas into series of small flat fields by means of ridges when placed in such a manner that they hold water. These absorb water and thus check run off.
(4) **Construction of Dams**: Heavy erosion like flood can be checked by constructing dams which provide water for irrigation and in the process infertile land can be converted into fertile ones.
(5) **Controlled grazing**: Excessive grazing renders land barren and the soil particles thus exposed become dry.
(6) **Soil fertility:** The fertility of the soil should be maintained by green manuring and using bio-fertilizers to restore the nutrients.

2) Forest Resources

The term 'forest' has been derived from the Latin word 'Foris' which means 'outside'. Forests are self sustaining wooden tracts with biotic community dominated by trees and plants.
It is said, only those nations which contain forests in one third of their geographical area, are fertile and receive copious rainfall.

Former Central Minister Mr. Mohan Dharia founded an organization named "Vanroy' in Poona and silently worked for afforestation. According to him, shortage of rainfall in our country could be avoided if we raise forests in 110 million hectares.

Uses of Forests

Direct Uses

1) Forests provide domestic fire wood, timber to make furniture and building materials like doors and windows. Forest products can also be used to produce sandal oil, paper boards, newsprint, cloth, match stick, agarbathi stick etc.
2) They also fulfill the human food needs to some extent, providing fruit trees like almond, walnut, cashew nut, chilgoza as well as honey.
3) They provide some herbal spices like nutmeg. Cinnamon and clove which help us curing human ailments.
4) Some kind of mineral deposits and valuable stones like diamond are obtained from forests.

Indirect Uses

i) Forests protect the soil from the direct action of rain and wind, as plants and trees hold the soil particles firmly. Thus soil erosion is prevented.

ii) Forests have a moderating effect on temperature and other climatic conditions. They increase the rainfall frequencies and the level of humidity in the atmosphere.

iii) Forests reduce atmospheric pollution by absorbing polluting gases particularly Co, and collecting suspended particulate matter.

iv) Forests offer food and shelter for many a wild animal and plant.

Deforestation

Deforestation is deliberate removal of forest cover by felling trees and burning plants. Some of the factors responsible for deforestation are conversion of forestland for

(i) creating human habitats
(ii) shifting cultivation
(iii) industrial demand of wood
(iv) mining. operations etc.

To protect forests, Indian Government legislated "Forest (Conservation) Act in 1980 and amended it in 1988 to ensure heavy punishment for the offenders.

Reasons for Deforestation

1) Rapid population growth that increases the pressure on the limited resources available.
2) Frequent forest fires, either natural or man- induced.
3) Flawed government policies for managing forests.
4) Colonial patterns of resource exploitation that emphasize on maximum short term gains.
5) High demand in developed nations for tropical timber and other commodities.
6) Shifting Cultivation: A patch of land is cleaned through looping and burning. The ash is mixed with soil. The cleared land is cultivated for 2 to 3 years. During this period the soil loses all its nutrients through run off.

Adverse Effects of Deforestation

i) Forests absorb rain water like a sponge and slowly release it when needed by the in the absence of forests, rain water as "run off", and it flows into the sea evaporated from land.
ii) Deforestation also leads to the erosion rich top soil, frequent floods, drought and desertification.
iii) Deforestation results in the building up of cat dioxide in the atmosphere, which ultimately leads to global warming. This is called 'green house effect'.
iv) Deforestation results in the loss of an important sink for ozone.
v) Deforestation leads to the destruction of tribal life.

Measures to Prevent Deforestation

i) Political interference in policy matters like denotification of various parts of sanctuaries, providing mining and quarrying rights, etc., should be done away with.
ii) There should be proper coordination among the various government departments to avoid delays in the settlement of various issues like disputes over the rights of the land and title.
iii) The nodal officers and departmental officers should be adequately motivated to check deforestation.
iv) New proposals for the establishment of hydroelectric, irrigation, mining, etc., should obtain clearance from Environmental Management Authority.

Afforestation

Growing trees as a crop to develop forests in those places where previously no forest existed is called afforestation, whereas **reforestation** refers to develop the cleaned forests into a full fledged forest cover.

To achieve this, Government of India brought forward "The Indian Forest Policy, 1988". Under this policy the following rules and regulations were framed and implemented:-

i) Raising new forest cover in watersheds, slopes and other ecologically fragile areas.
ii) Growing industry oriented trees like Teak, Casurina, Oak etc. which do not require much water.
iii) Encouraging urban forestry.
iv) Encouraging Agro-forestry.

3) Water Resources

Water is most important natural resource. It is vital for the maintenance of all forms of life and vegetation. We depend on water for irrigation, industry, domestic needs, drinking purpose, for sanitation and disposal of waste. Our water bodies are ponds, lakes, sea, rivers and oceans.

70% of the Earth is covered by water and that is why it is called the 'Blue Planet'. Only 2.5% of the world's water is fresh while 97.5% is found in our oceans. Only 0.3% of fresh water is available from rivers, lakes and reservoirs; 30% from ground water; the rest is stored in distant glaciers, ice sheets and inaccessible areas.

Water Resources in India

India has the following water resources:-

(i) Rain Water

(ii) Surface - Flow Water

(iii) Ground Water.

(i) Rain Water: India receives 70% of its rain fall through South West monsoon lasting from June to September and the rest 25% from Northeast monsoon during October to December. In our country, Chirapunji in Meghalaya receives the highest rainfall and the lowest rainfall occurs in Western Rajasthan. Whenever monsoons fail, water scarcity occurs in India. Deforestation is said to be the major reason for decrease in rainfall. Rain water could be conserved effectively by erecting rain water harvesting structures in every building and the run off water could be deposited by constructing dams and check dams across the rivers.

(ii) Surface-Flow Water: Lakes, Ponds and Rivers are referred to as Surface-flow Water resources. Rainwater is the source for all the lakes, ponds and rivers.

Ganges, Yamuna, Sindhu, Brahmaputra, Godavari, Krishna, Narmada, Tapti, Mahanadi, Vaigai and Cauvery are the major rivers of India. Among these the rivers Ganga, Yamuna, Sindhu and Brahmaputra originate from the higher altitudes of the Himalayas and the water flow in them is due to melting of snow and icebergs. These rivers are **perennial rivers**.

(iii) Ground Water

Water deposits found at a depth of about 1000 metres, from the earth surface are known as ground water. This could be pumped out through bore wells and used for domestic and industrial water supply as well as for irrigation. Ground water is the part of sub-surface water. The hard upper surface of earth consisting of top soil layers and rocky subsoil layers, contains two zones

(i) Aeration Zone

(ii) Saturation Zone

Water percolated and spread in these zones forms the ground water deposits.

Uses of Water and its Over- exploitation

Water is an essential need for human life. As the world population increases, water need also increases. But monsoon-failures have become too common nowadays and surface water sources get increasingly polluted day by day.

We have started overexploiting ground water through bore wells to meet the water themselves demand for agriculture, industrial and domestic uses. If this situation persists for long, then will spread and people quarrel among for a pot of water. So there is an urgent need for the Government and people to find a solution for wale scarcity.

Ways and Means of Controlling Water Scarcity in India

Water scarcity could be avoided to a great extend by conserving the three kinds of water resources(rain water, surface-flow water & ground water) and ensuring economic consumption of water in our daily life.

Copious rain water received during the monsoon seasons could be conserved and stored by constructing dams across the rivers, constructing numerous checkdams here and there across the waterways, constructing recharge wells along the roadsides, roof-top rain water harvesting arrangements in urban dwellings and multistoried apartments and diversion of run-off water into existing surface water bodies like ponds and lakes are the measures suggested to tackle water scarcity.

Disilting of existing water storage systems like ponds, wells, lakes and dams go a long way in the conservation of water as they increase the capacity of storage of water resources. Preventing pollution of water and its sources, recycling of waste water from the household kitchen and bathrooms and use it for vehicle washing and watering plants in the garden are the other measures suggested to conserve water by economizing human consumption of water.

4) Mineral Resources

Mineral resources could be broadly be defined as 'Substances, Chemical compounds, rock concentrates having a definite physical and chemical composition in a form that can be refined or extracted to be used as a commodity'.

Glass tumblers, tools and equipment, utensils we use are all made of minerals. Predominantly minerals are inorganic in origin (e.g. Metals like Gold, Platinum and Iron, non-metals like Gypsum, diamond, mineral salts); but a few minerals like petroleum, amber and coal are organic in nature.

Minerals are extracted from the earth in two ways:

(i) Open pit type mining

(ii) Closed tunnel type mining.

Categories of Mineral Resources

Minerals may be classified into the following three categories:

i) Metallic Minerals

ii) Non-metallic Minerals

iii) Fuel Minerals

(i) Metallic Minerals

Metallic minerals like Gold, Chromium, Nickel, Platinum etc. are found as particles embedded in hard rocks. Metals like Aluminium, Manganese, Iron, Copper etc. are not found as metallic particles but found in the form of their respective compounds.

Iron, Aluminium, Chromium, Manganese, Titanium and Magnesium are abundant and while other metallic minerals like copper, Lead, Zinc, Tin, Gold, Silver, Platinum, Uranium, Mercury, Molybdenum are scarce.

(ii) Non-metallic Minerals

Non-metallic minerals range from silicate minerals to sand, gravel, salts, soils, diamond, limestone, asbestos, Gypsum etc. These kinds mineral resources are found in Karnataka, Rajasthan and Bihar. Gypsum and Mica are found in Tamilnadu. Diamond is found to some extent in Madhya Pradesh

(iii) Fuel Minerals

Coal, Petroleum and amber belong to category of fuel minerals. In India Coal is available in abundance, particularly in West Bengal, Orissa, Bihar, etc. Lign (Brown Coal) is available in Neyveli, Tamilnadu. Petroleum is found in Assam and Gujarat State as well as in Godavari basin and Bombay high seas. Plutonium is found in the Trivandrum beach.

Mineral resources are finite and at certain point, will be exhausted. In that case, there are four possible solutions which are explore for more minerals, recycle what has already been extracted is in use, find out an alternative or substitute for a mineral in demand etc.

Uses of Mineral Resources

i) Gold, Silver and Diamond are used in the manufacture of jewels.
ii) Copper, aluminium, iron and nickel are used in the manufacture of various household articles, utensils, etc.
iii) Diamond, Platinum and many other metals find many industrial uses, in the production of various materials.
iv) Aluminium is used to produce the body of aeroplanes and automobile engines.
v) Coal and petroleum are used as various kinds of fuel from cooking to aviation.
vi) Without the use of iron no weapons and tools, room fixtures and fittings, vehicles etc. could be manufactured. That is why **iron is referred to as black gold**, indicating its high value.

Adverse Effects of Mining on Environment

Minerals are the rich natural resources of any country. Mining inflicts heavy damage to the environment and degrade its quality in the following ways:

(i) Air Pollution: Blasting the rocks, using drilling machines, transport etc, contribute for the increase of dust and suspended particles in air. Thus in and around the mines, atmospheric pollution is very high.

(ii) Water Pollution: Water discharged from the mines, percolates into the earth, polluting the fresh water aquifers due to which people are affected by various diseases. Agriculture and live stock too are affected by mining.

(iii) Land Pollution: It is the land which suffers the most due to mining. To produce few tones of gold, million tones of earth are to be removed. This kind of operations cause soil erosion and earth tremors. Once the mining operations are over, the land is abandoned as useless or badly damaged. No vegetation is possible in these lands.

(iv) Noise Pollution: Mining and other related operations create heavy noise pollution in and around the quarries.

(v) Deforestation: For operationalizing a mine, large tract of forest cover is destroyed. This affects the biodiversity in that region apart from accelerating soil erosion.

Ways and Means of Preventing Over-Exploitation of Mineral Resources

(i) Wildlife (Protection) Act 1972 (Amended in 1991 and 2002)
(ii) Water (Prevention and Control of Pollution) A 1974 (Amended in 1988)
(iii) Forest (Conservation) Act, 1980 (Amended 1988)
(iv) Environment (Protection) Act, 1986
(v) National Mineral Policy of India, enunciated 1983 forbids mining operations in the reserve forest for wild life as well as the wild life sanctuaries.

The amended National Mineral Policy, 2008 insist on the following:

i) Carry out the search of mineral resources in sea beds with the help of Remote Sensing Satellite.
ii) Application of advanced technologies to be used in mining out minerals.
iii) Ensuring that livelihood of tribal people is not adversely affected.
iv) Preservation of wildlife forests and sanctuaries.

(5) Food Resources

Food is the second priority of man in his list of basic needs, the first being water. Food is sustenance. Once man left the forests to settle near the river side, he started cultivating crops and domestication of animals to meet his food needs. Today in India, rice, wheat and corn form the staple food of man; fish and sea food as well as milk a meat obtained from live-stock supplement the needs of man.

Important Sources of Food

1. Agriculture: Agriculture products form the major source of food for man. To increase agricultural productivity, improved irrigation systems were developed; better seeds and improved methods of tillage helped to Increase the annual harvest. The three major causes for decrease in food production are soil erosion, desertification and farmland Conversion.

2. Fisheries and Sea Food: Fish and marine organisms too serve as human food. Majority of people in the world like eating fish and sea food as they are rich in protein. Fish and marine resources too are decreasing day by day due to environmental changes, water pollution and over-fishing. This could be avoided by establishing and maintaining fish farms and increase fish production.

3. Live-Stocks: Domestic animals reared in our houses like go cow, hen, cock etc. provide meat to us. Apart from these, growing mushroom is also now gaining significant attention.

Food Crisis

In the world, developed countries having vast areas of land are not much affected by food crisis. But developing countries like India, Pakistan and Bangladesh as well as most of the under-developed African countries are at present encountering severe food crisis.

In independent India, though food production increases year after year, thanks to five year plans, due to uncontrolled population growth, food demand also goes on increasing making the situation quite difficult to meet both ends. Further we lack adequate infrastructure for storing the food grains as well as good transport facilities to ensure proper distribution of food in all regions of the country, resulting in starvation deaths in some places.

In short, some of the **important dimensions of food crisis** are slow economic growth of the country, inadequate food production, lack of quality warehouses to store food materials and good transport facilities, malnutrition, lack of awareness about 'balanced diet', etc.

Ways of solving the Food Crisis

Solving of food crisis has the following two dimensions:

1. **Increasing Food Production:**

(a) Promotion of intensive agriculture
(b) Providing more irrigation facilities
(c) Updating the barren lands to become fit for farming
(d) Applying latest techniques/ technologies in agriculture
(e) Judicious use of organic and chemical fertilizers.

2. Improvement in Agricultural Management:

(i) Training farmers in the modern techniques and technologies in agriculture
(ii) Making effort to minimize the cost of production of agricultural produce.
(iii) Providing easy and low interest loan and Insurance facilities to farmers by the government.
(iv) Planning of crop cultivation by rotation

(6) Energy Resources

The economic development of country is judged in terms of the total amount energy generated and made use of. Early man discovered fire and its uses. Later on,other sources of energy like timber, agricultural wastes, fossil fuels like coal and petroleum, natural gas etc. were identified and put into use. Today electric power occupies a prime place in human life though other sources of energy are also tapped extensively using modern technologies.

Growing Energy Needs

Demand for energy continues to grow due many factors such as increasing population, expanding industries and occupations, more consumption of power, global warming, etc.

State Governments also try to manage the power front by adopting various strategies like imposing power cuts, power interruption and power regulation measures. As a result of this our industries get crippled and production suffers. To tide over the power crisis, Tamilnadu Government has announced its "Solar Energy Policy 2012" and initiated measures to achieve a target of generating 3000 MW of solar power per day by 2015.

After a long tussle, with warring groups of people opposing the operation of Nuclear Power Station at Kudangulam, it started generating power in its first plant from October 2013 and second plant started production from October 2016, both generating 2000 MV of Power.

Kinds of Energy Resources

The different types of energy resources may be divided into two major types:

(i) Non-Renewable energy resources and
(ii) Renewable energy resources.

1. Non-Renewable Energy Resources: Energy resources which get depleted on continued large scale use finally become completely exhausted in few decades is called "non renewable energy sources".

Eg:- Fossil fuels like coal, petroleum, natural gas, electricity and atomic energy.

2. Renewable Energy Resources: Energy resources which are found in unlimited measures in nature and available without any interruption is known as "renewable energy resources". It is also called, "non-exhaustible energy resources".

Eg:- Energy received from the sun, water, waves, air, etc.

Different forms of Non-renewable Energy Sources

1. **Fossil Fuels:** The remains of plants, trees and animals which decayed and got buried deep in the earth for thousands of years slowly get transformed into fossil fuels.

i) Crude Oil or Petroleum- Petroleum deposits are found in the river basins and coasts, at a very great depth.

ii) Natural gas- Natural gas is generally spotted in those places where petroleum wells are located. On burning

iii) Coal- In the world, Coal is the abundantly available fossil fuel, but the production and consumption of coal greatly affects the environment.

2. Atomic Power: Nuclear Power stations convert the enormous quantity of heat released by splitting an atom of Uranium(nuclear fission) to generate electricity.
The pollution and cost of transporting caused by nuclear power stations is relatively less compared to the use of petroleum and coal.
But disposing the nuclear wastes is really a challenging task; thermal pollution is also high. Chances are more for the employees of nuclear power plant as well as those living near it to get affected in health due to constant radiations. Further the cost of establishing and maintaining a nuclear plant is high; availability of fissionable uranium is also less.

Different forms of Renewable Resources

1. Hydro-electric Power:

It is a conventional renewable energy source. The water deposited in dams built across rivers is ejected through specially designed pipes to out with great force which drives turbines to produce electricity. The big advantages hydro-electric power plants are, the cost production is low; practically no pollution takes place and the technology used is of high quality.

Apart from being a renewable source of energy, it helps control flood, facilitate irrigation and transport. Further, construction cost of dam is very high; destruction forest, chances for earthquakes is also high due to depositing of water in the dam.

2. Wind Energy:

Among the non-conventional energy resource wind is an important one. Like Sunlight, wind blows through out the world and is also a renewable energy Wind mills are installed in high wind zones and electricity is produced with the help of strong wind. Tamilnadu is leading in producing electricity by wind energy followed by Gujarat.

Merits

a) Wind energy is a renewable resource.
b) Wind required for running the wind mills is free of cost.
c) There is no environmental pollution.
d) Cost of production is very low.

Demerits

a) Windmills can not operate in low wind zones.
b) Wind flow will not be strong, through out the year and hence power generation is seasonal
c) Windmills get damaged during storm.
d) Windmills may spoil the beauty of the natural scenery of a place

3. Biomass and Biogas Energy

When organic wastes of plants and animals decays, biogas (Methane) is released which could be used as an alternative fuel. After producing methane, the residual wastes can be used as manure for plants. Burning of biogas causes no environmental pollution. In rural areas cow dung is used to produce gober gas and this gas is utilized for cooking and lighting.

Merits

i) As energy is produced from organic wastes, which are available in abundance in rural areas, production cost is cheap.
Ii) As most of the waste are used for energy production and the rest as manure, there is practically no environmental pollution.

Demerits

i) This method is not viable in all areas except some rural pockets.
Ii) There are practical difficulties in collecting, storing and using for energy production.
Iii) Rural people do not show much interest in using biomass energy.

Biomass energy meets 20% of the world energy requirements. This non-conventional source of energy proves to be a helping hand for developing countries to tide over energy deficits.

4. Solar Energy

Sun is the primary source of energy which could be tapped from solar radiation.In general, solar energy can be used in two methods:

(i) Solar Photo Voltaic Power System: In this method, solar energy is transformed into electricity through solar cells made up of silicon. By fixing silicon cells on roof top of building terraces, we can generate electricity.

(ii) Solar Thermal Energy System: By using Solar Thermal Collectors, the heat received from solar radiation could be transformed into thermal energy.

Merits

a) Solar energy is a renewable non-conventional resource.
B) Solar energy is available throughout the year in equatorial and tropical regions.
C) There is no environmental pollution.
D) Input for solar devices costs nothing.

Demerits

a) To develop solar silicon panels, large amount of capital is required.
B) During cloudy and rainy days production of electricity and heating are affected.
C) Cadmium used in the production of solar cells is poisonous.

5. Tidal and Wave Energy

Sea water is allowed to flow with high force into a reservoir on the seashore during high tide. The water flow is used to rotate the turbines and electricity is produced. The stored water is allowed to return into the sea again through the same turbine during the low tide and here again electricity is generated.

Merits

i) Electricity produced by using waves and tides causes no environmental pollution.
Ii) It is a renewable and non-conventional energy source and production of electricity is cheap.
Iii) It can be implemented in regions having big seas.

Demerits

i) The amount of electricity produced by this method is very low.
Ii) This method can not be implemented in regions which do not have large waves and tides.
Iii) During storms, electricity producing equipment may get damaged.

6. Geothermal Energy

In regions where volcanic activity is high, hot springs are found. The steam released from these hot springs could be used to rotate the turbines to produce electricity. In Java Islands of Indonesia, and in some other regions, water is artificially pumped into the earth and this water is converted into steam due to the high temperature in the interior of the earth. This steam is used for generating electricity.

Merits

i) This is a renewable non-conventional source of energy.
Ii) Geothermal energy is eco-friendly and pollution free.
Iii) Electricity produced in this method is very cheap.

Demerits

i) The construction and maintenance cost of plant is high in volcanic regions.
Ii) Equipment and structures will be lost dun earth quakes and volcanic eruptions.
Iii) At times, harmful sulphur gas may come with, from the interior of the earth steam.


Thank you