Environmental Management.

Paper-I.

Unit-1

Lithosphere

Deepwater Horizon.

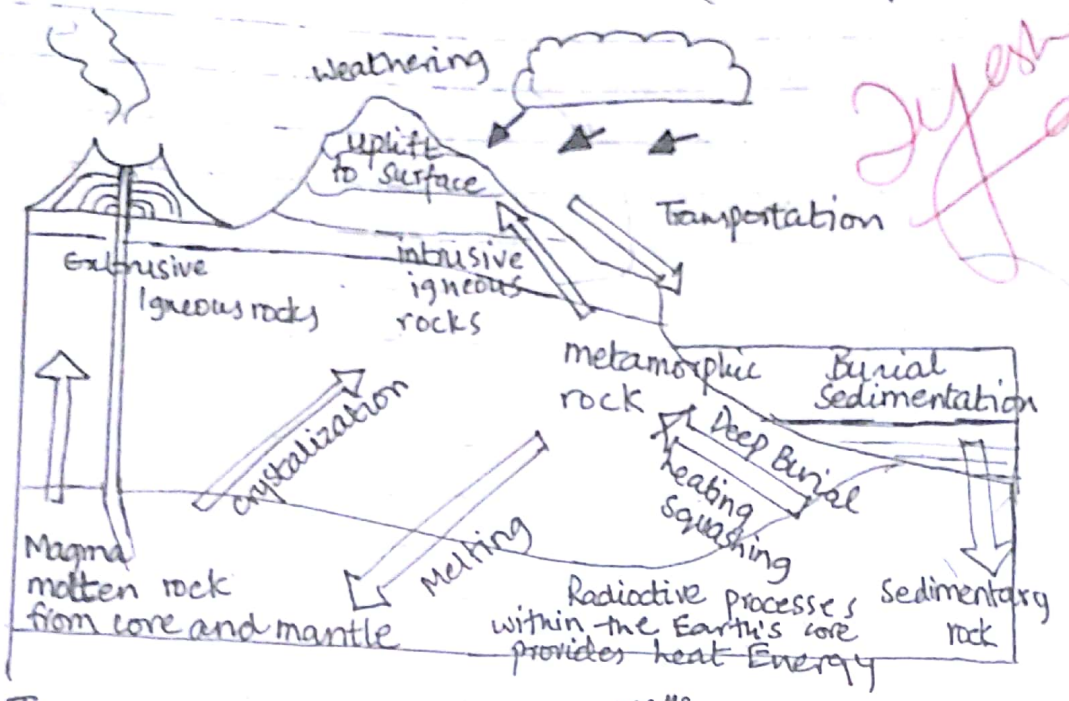
Syllabus Code 5014

For Environmental Management

Unit-I

Types of Rocks. Lithosphere

Iyesha Jawaad



1- Igneous Rocks: These are rocks formed by fire. They are associated with volcanic activity. Magma from the mantle, which rises upwards towards the surface, forms igneous rocks when it cools. Granite & Basalt are the two most common types.

2- Sedimentary rocks: These rocks are made of Sediments. They are small particles of rock broken off from rocks which outcropped on the Earth's Surface. These particles reach the Sea bed, where they accumulate in layers. The weight of sediments above compressed those below into Sedimentary rocks. Sand Stone is one type.

3- Metamorphic rocks: These are rocks which

have been changed by heat and pressure in the Earth's crust. Rocks in contact with new magma flows are changed by the heat. Rocks on plate boundaries are changed by the pressure & stress which accompanies great earth movements. e.g Lime stone is changed into marble and clay turned into Slate.

Minerals: It is a substance obtained by mining like Iron & Bauxite are abundant in the rocks of the Earth's crust. But Gold, Tin & Copper are rarely found in ordinary rocks.

Mineral Reserves:-
A reserve is a known source of the mineral, which has not yet been mined.

Types of Mining

- Open cast Mining
  - Minerals are located to the top or Seam.
- Deep Mining
  - Minerals are deep into the land.
  - Stages of Deep Mining
    - 1) Adit Mining
      - Minerals are extracted using horizontal Passage.
    - 2) Shaft Mining
      - Minerals are extracted vertically upwards.

Stages involved in open cast Mining

- Clear the vegetation & remove the top soil.
- Break up the rock by using explosives.
- use diggers to remove the loose rock.
- Tip the rock or mineral into trucks or railway wagons.

Deep Mining involves:

- Sinking a vertical shaft down to the rock containing mineral.
- Making a horizontal tunnel.
- Extracting the minerals by digging done by miners & machines.
- Bringing the loose rocks from the mine and pile it up.
- Bringing the minerals to the surface.

Effects of Mining (Negative)

1- Deforestation, Loss of cultivable land Air, noise & water pollution, Loss of scenic beauty, Spread of different diseases in the miners

2- (Positive) Industrialization, Rise in exports Rise in the Balance of payments, job opportunities.

A Shield is a low-lying area build of old & hard rocks.

Distribution, Types and reserves of major minerals.

Main Areas of minerals in the world

1- Canadian Shield
2- Brazilian Plateau
3- Baltic Shield.
4- African Plateau
5- Deccan plateau In India
6- Plateau of Western Australia
7- The Rockies in North America
8- Andes in South America.

Classification of Mineral

Metallic	Non-metallic
Iron, Copper, Tin	→ Sulphur Salt
Bauxite, lead,	→ Potash, Sulphates
Gold Silver	→ oil, (Petroleum)
	→ Coal
	→ diamonds & Emeralds

African countries which depend most on exporting minerals.

1- Algeria, Libya, Guinea, Nigeria, Congo
Oil, Gas + Oil & Gas + Bauxite + oil & Gas + oil & Gas
2- Zambia - Copper
3- South Africa - Gold & Diamond.

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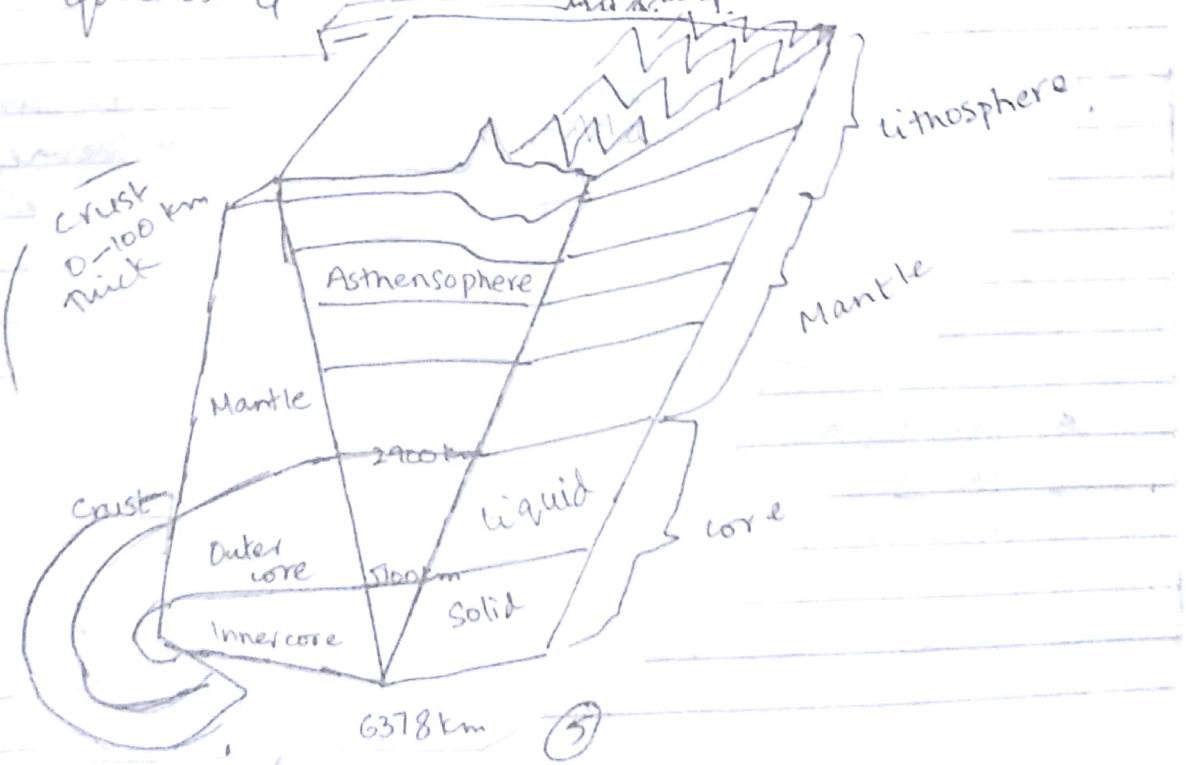
(2) Structure of the Earth

The earth is made up of series of layers

- Outer core is the inner most part of the earth composed of Iron & Nickel (temp: 5000°C)
- Inner core is the central part of the earth and has liquid properties (temp 3000°C)
- Mantle Middle layer of the earth, a thick shell of molten rock – (2800 km thick)
- Crust is the outer layer – the Earth's crust is not just one continuous layer that is made up of seven large tectonic plates & many smaller ones. (75 km thick)

Tectonic theory: The word tectonic means builder - This theory suggests that surface of the earth is made up of rigid plates of lithosphere. Plates are in constant motion. It explains the processes of earth such as drifting of continents, mountain building, earth quakes & volcanic activity.



Industry leads to Economic & Social Change

- Industrial Revolution in 1750 in Europe & the other parts of the world, the invention of the steam engine revolutionized Industry and transport. Railway revolutionized transport over land.
- For the first time it became possible to move heavy goods to all parts of a country over long distances. Iron ships, powered by steam, began to link places in all parts of the world with a speed and reliability.
- All these inventions increased the human need for energy and for fossil fuels

How Supply and demand affects mining

- Supply refers to the amount of a resource that is known to exist and can be exploited when needed.
- Demand refers to the amount that people need to use.

There are mines in some of the world's wildest places. Cold polar regions in Alaska, Northern Canada & Siberia in Russia are rich in minerals. Big deposits of minerals for which demand is high, attract mining companies despite the high cost of building transport links. One example is drilling for oil in Alaska.

- World market prices for all minerals fluctuate greatly. When cold winter weather weather hits Europe and North America, the demand for, tends to push world oil prices upwards. When warm winters, demand goes down. There

is surplus oil and the price falls again.

There is great fluctuation in the world price of Gold during a thirty year period. When the prices are high, even mines that are expensive to work are kept open. If the prices remain high companies search for new deposits and open up new mines. However, when world prices are low, the smaller & less productive mines are closed as owners cut back on production and concentrate on their most profitable mines.

Fossil Fuels as Sources of Energy:

Coal, oil and natural gas are the three fossil fuels. They have common characteristics.

- Formed from the decomposition of the remains of plants & animals.
- It has taken millions of years for them to accumulate and form deposits which are large enough to be mined for human use.

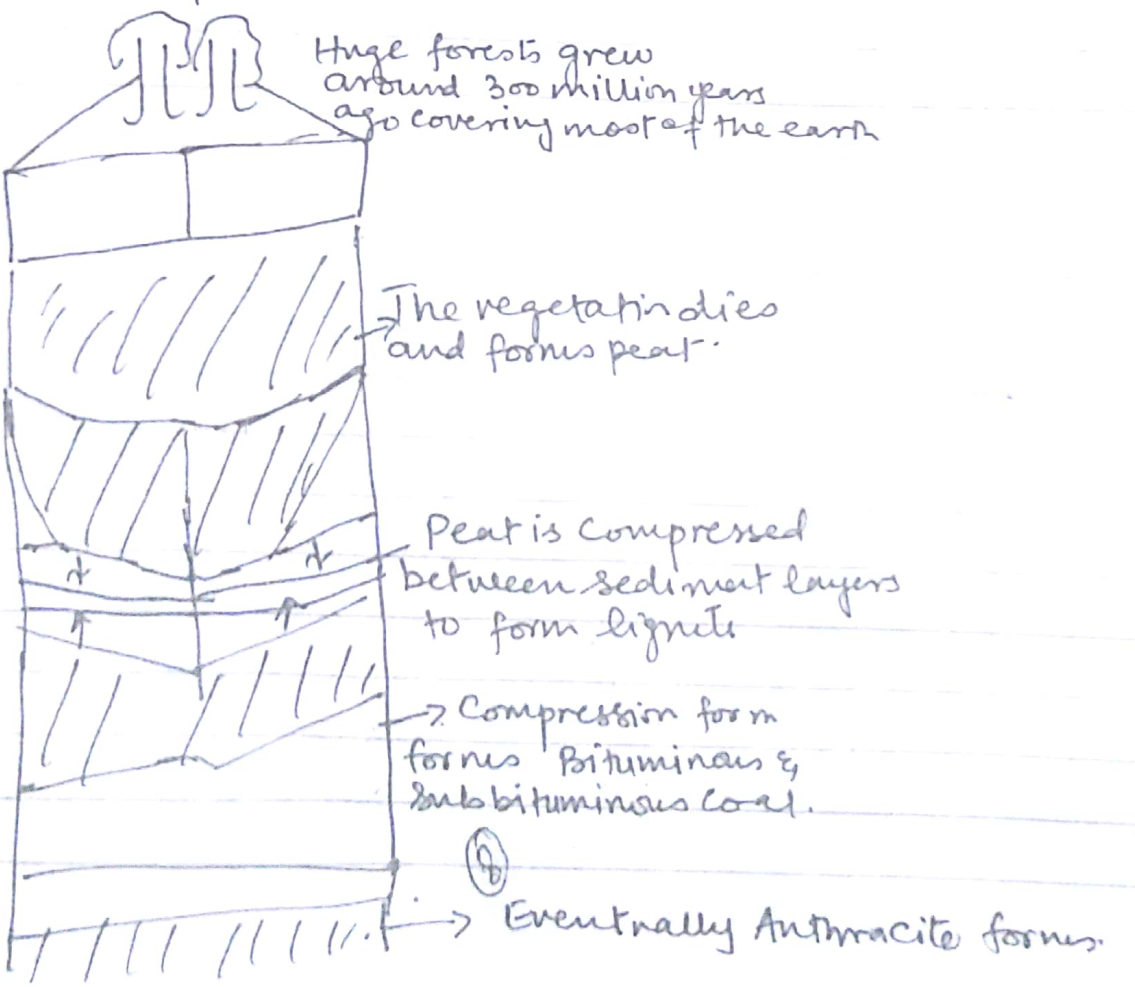
Formation of Coal:

In places where seams of coal are found today, there were dense forests about 300 million years ago in the Carboniferous. These forests were similar to the tropical rainforests now found near the Equator in the Amazon and Congo basins. As older trees and plants died, dead vegetation decomposed on the swampy

forests floors. In time, it formed a thick layer of peat. Later rivers covered the peat with deposits of mud and sand; over millions of years, mud and sand were compressed into sedimentary rocks and the peat hardened into coal.

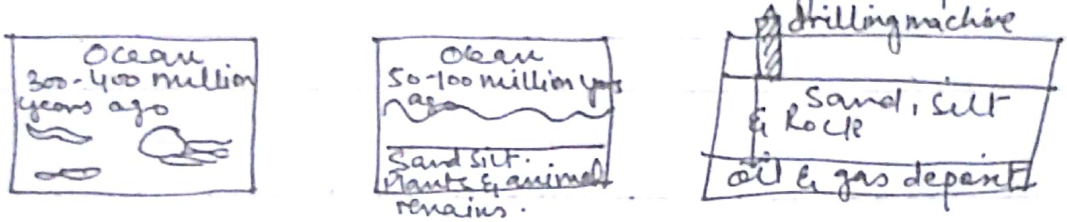
Formation of oil and natural gas

These were formed from the decomposition of plants and dead creatures, which collected in layers on the sea bed. Each one rotted to form a tiny spot of oil. Their remains were covered by mud & sand. Sand was compressed into hard sandstone rock, the oil & gas separated and rose through the sandstone, filling in the spaces between the particles of rock. The lighter gas rises to the top.



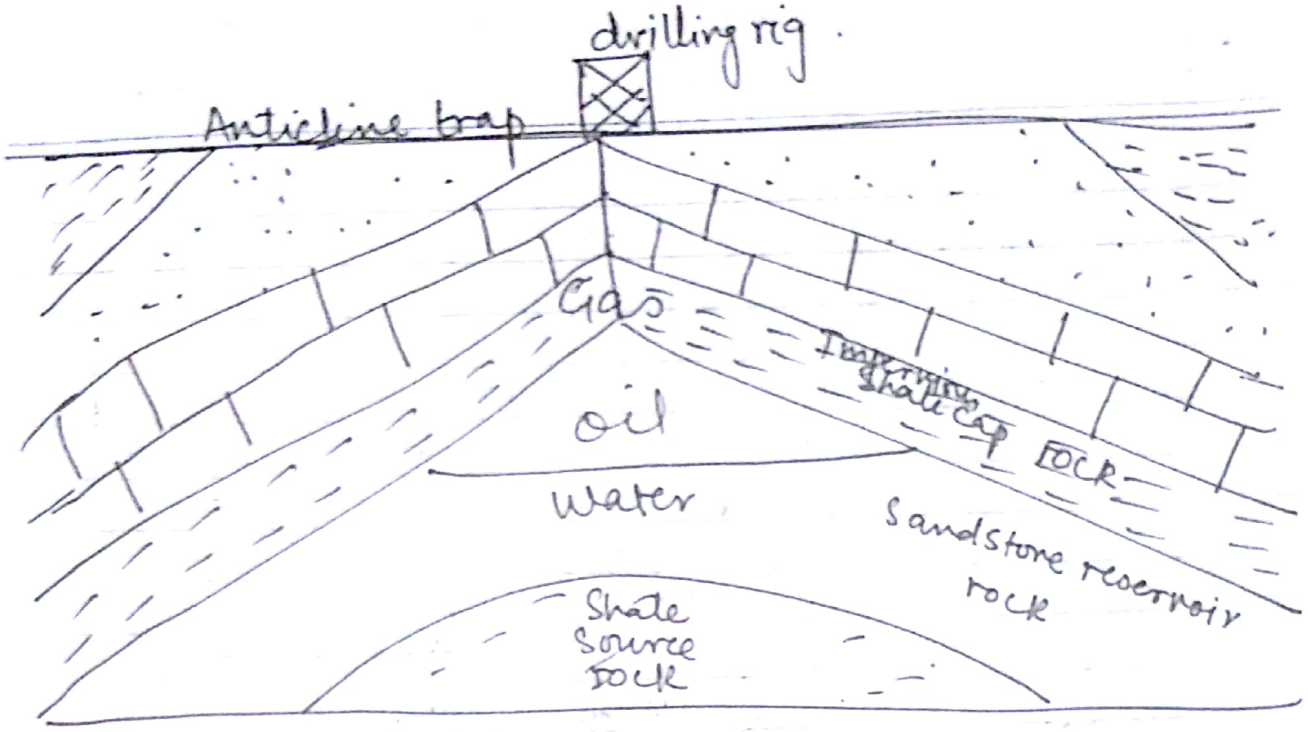
(3) Search and Extraction of Coal, Oil & Gas

Tiny sea plants and animals died and were buried on the ocean floor. over time, they were covered by layers of silt and sand. Over millions of years, the remains were buried deeper & deeper. The enormous heat & pressure turned them into oil & gas. Today we drill down through layers of sand, silt and rock to reach the rock formations that contain oil & gas deposits.



Coal cannot be mined as deep as other minerals because of high temperature, deep underground increase the risk of combustion. For seams of Coal that lie too far below the surface, deep mining methods of extraction are needed e.g deep Adit & Shaft mining.

Different Methods are used to extract oil & natural gas. oil and gas are found at anticline oil trap. The oil & gas rise to the top of the Porous sandstone rock, where they are trapped by the impervious rock. Drilling is the only way of finding out whether oil & gas are present. In many oil fields a red flame or 'flare stack' can be seen. Natural gas from the oil well is being burnt off, although increasingly this gas is being used instead of being wasted. They are transported from the drilling site by pipeline.



Bio mass includes fuel wood, animal dung and crop wastes.

Types of Energy Production

1- Fossil fuels
2. Nuclear energy and HEP are only non-fossil fuels in widespread commercial use.

Production of Nuclear Energy:

It is produced by fission. At the centre of each atom is a nucleus, as an atom is split using Uranium in a nuclear reactor, a great deal of heat-energy is realeased.

Nuclear energy contributed only between 7.1 and 8.1 of total world commercial energy consumption in 2002. It was the main way of making electricity in countries like France & Japan.

Public confidence in Nuclear power was shattered by the great explosion in the Ukraine. This killed workers, caused cancers to people living near the plant and created a highly radioactive zone in the area around the works, making it unsafe for ppl to live there for 100 years.

The top 6 producers of nuclear power are
1-U.S.A 2- France 3- Japan 4- Russia 5- S. Korea 6- Germany

Energy Production & Patterns of Global Trade

- Nuclear energy generates little world trade, as it is expensive to move & of course dangerous radioactive wastes.
- The world top ten coal producing countries are located outside the tropics in the temperate latitudes like China, U.S.A, Australia, India, Russia, South Africa, Indonesia, Poland, Kazakhstan & Colombia. Most of these countries have industries & power stations which burn coal.
- There is a large export of coal from Australia to Japan. (Japan is short of its own supplies of fossil fuels due to high rate of Industrialization). ★ Oil is obtained from over 50 countries of the world & is more widely distributed than coal.

★ Oil is of much greater importance in World trade using super tankers & Pipelines. Its uses are varied, including transport, heating, electricity & for chemicals.

Top 14 oil production countries are till 2008- 1- Saudia Arabia 2- Russia 3- U.S.A 4- Mexico 5- China 6- Iran 7- Norway 8- Venezuela 9- Canada 10- Brazil 11- UAE 12- Iraq 13- Nigeria 14- Kuwait.

★ Five of the world's top 14 oil production countries are located in the Middle East. North America (U.S.A, Canada & Mexico) is the region with the second largest output.

★ Norway & UK are the leading European producers, but their oil is expensive to obtain because it has to be drilled from under the North Sea.

* In Africa, the largest oil deposits are on the sides of the Atlantic Ocean from Nigeria to Angola.
* A second major producing area is on the Northern edges of the Sahara desert in Algeria & Libya.
* Indonesia is the 2nd largest Asian producer with an annual output of over 60 million tonnes. followed by Malaysia & India.

Many of the large oil producing regions are found in developing countries, whereas the greatest demand for oil is in developed countries. This mismatch between oil producing & consuming regions is one of the reasons why the world trade in oil is so great.

Environmental Problems due to Fossil fuels.

- Mining leaves great scars on the landscape & the piles of waste on the surface.
- Drilling can lead to oil spills such as in Alaska when pipeline break & oil seeps into the ground causing land pollution. thick black oil leaking oil kills all the animal & plant life covers tourist beaches.
- Air pollution • Main cause of acid rain
- threat of global warming • flooding of low-lying coastal land resulting in loss of habitat, ecosystem & changes in temperature & precipitation.

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Alternative Energy Sources (4)

It is refer to an energy source that can be used as a replacement for fossil fuels, that can be used for a long time into the future.

The alternative energy sources that are sustainable also are

1- HEP: fast flowing water, such as from water fall
2- Geothermal: heat from the ground in the areas of volcanic activity.
3- Solar: heat from the light of the sun using solar panels & P.V. cells
4- Wave: force of the sea waves as they break against the coastline
5- Wind using 3 bladed tall turbines driven by the force of the wind.
6- BioMass using fuel wood, crop wastes & animal dung as fuel

Advantages of Alternative Energy Sources:

- Always available
- No local Air or water pollution
- As locally available, can meet small-scale needs
- don't contribute to global warming & no carbon emission.

Disadvantages of Alternative Energy Sources:-

- too expensive for Poor countries to set up & use
- high cost of research into new technology
- PVs turn sunlight into energy toxic substances such as cadmium Sulphide
- wind turbines become noisy & spoil the beauty of a place • wrong weather - Some days with or without Sun or wind.

HEP.

Favourable physical conditions are • fast flowing water • high rainfall throughout the year • A natural store of water such as Lake • A narrow steep valley suitable for building a dam.

Once it is running, it is one of the cheapest way of making electricity without pollution because water is neither consumed & nor

contaminated to produce H.E.P. • It can used for drinking & for irrigation.

Effects of Making Dams

- deforestation • loss of natural habitat
- Loss of cultivable land. Large no of ppl have to be displaced • Poor countries may go into debt as expensive project to install

Advantages • Flood control • providing irrigation all year round • Scenic beauty • Job opportunities • Industrialization leads to improved balance of payments & G.D.P.

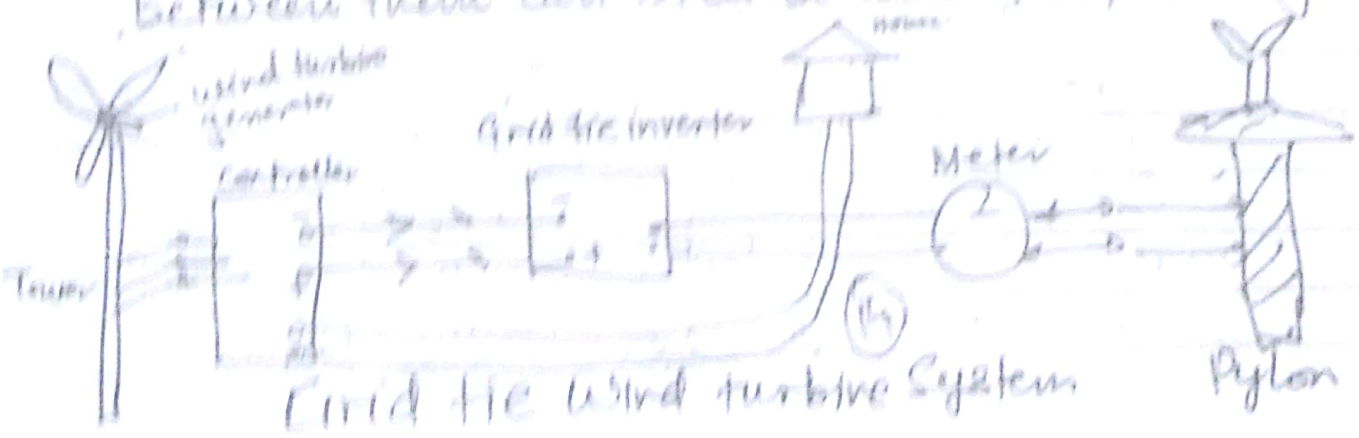
Wind Power

It is a common sight in countries like Europe, Denmark, Germany, Spain & UK where average wind speeds are high.

Wind turbines are placed where strong winds are most frequent e.g on hill tops & areas of open high ground • Along the coast line • off shore (in the sea) but close to the coast.

Wind turbine stands over 30 meters high and has blades made up of fibre glass 35m or more across. When several are placed close together they make what is called a 'Wind farm'

Turbines take up little land and the land between them can still be used for farming.



Grid tie wind turbine system

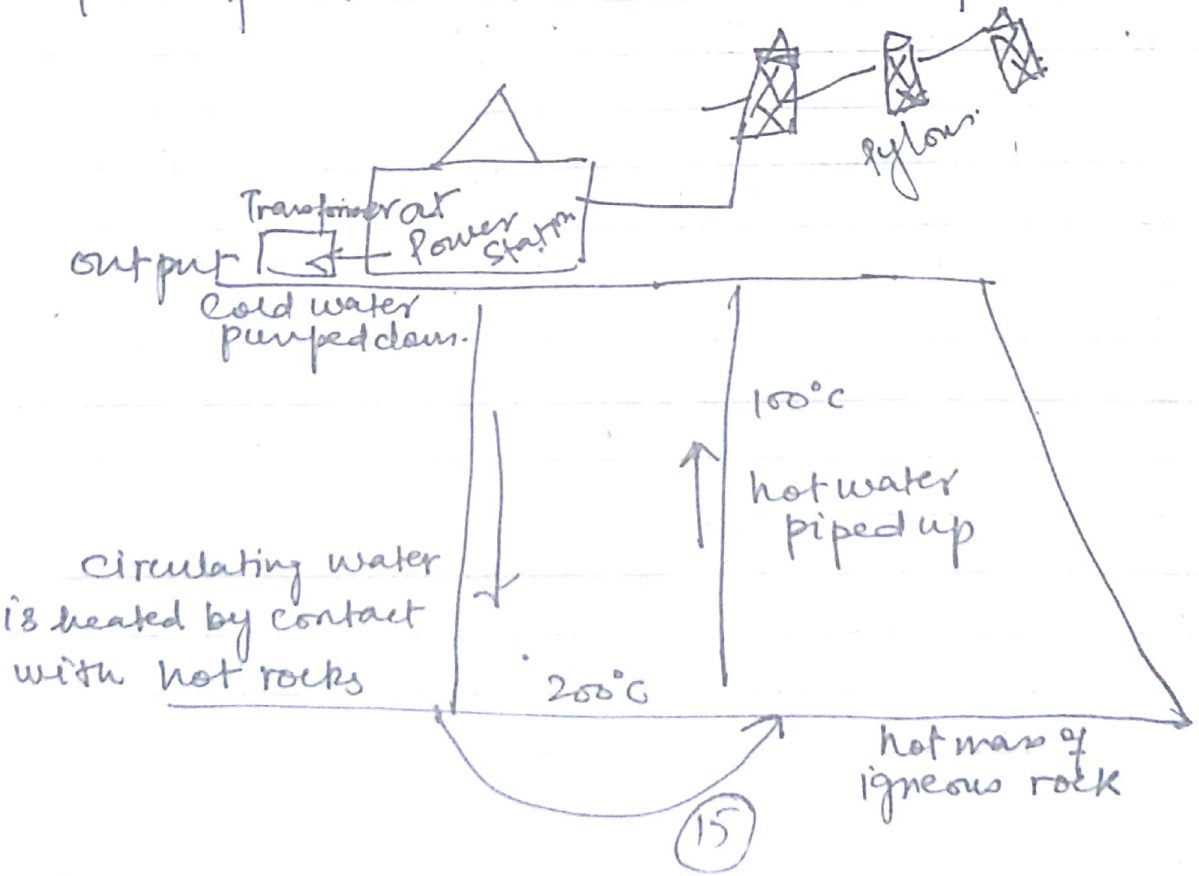
Solar Power:

It is more expensive than wind power and it is only used in small schemes. More researchs & development are needed to make P.V. cells cheaper to buy & use.

Geo Thermal Power:

Heat from the ground is used for geo thermal power. Holes are bored deep into the ground to allow steam to come to the surface. Where it is taken through pipes to a power station. The steam turns the turbine which generate electricity, just as in all other types of power stations

Iceland, a country of just 300,000 ppl meets 90% of its energy needs from geo thermal & H.E.P It is a volcanic island with many steaming geyers & hot springs on the surface as well as pools of hot water under the surface lava fields



Strategies for conservation & Management of fossil fuel reserves

* Developing alternatives is one approach to energy conservation & management. Finding new alternatives requires technology. Using P.V cells to use solar power is an example of new technology. More research is focussed upon the processing of silicon that would be needed to reduce the cost, so that cells can be used more widely in developing countries.
* The big hope for future energy is hydrogen. Fuel cell cars & hydrogen buses have already been made. The hydrogen they run on is green and it always comes from mixing fossil fuels such as natural gas with high temperature steam. It is the cheapest, greenest & the most renewable source of energy of all — Sunlight. The aim is to generate renewable hydrogen to produce electricity.
* Recycling as an idea for saving resources is not new. In steel industry, scrap iron is collected and reused which saves up the amount of iron ore needed. Another example is recycling in an energy context is using power from the burning of waste. Instead of tipping waste collected from a city into a landfill site, which has some environmental drawbacks it can be incinerated. In a well-planned & well managed situation, the heat from the burning wastes makes steam, which can be harnessed to drive a turbine to generate electricity. The hot water that is produced can have a second use it can be piped to heat houses, shops, offices & public buildings for people in the nearby city, who produced waste.

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Plate tectonics.

The earth's crust is not one continuous unbroken layer. It is divided up into Seven major plates and many smaller ones. In the middle of the plates little tectonic activity is occuring, but at the plate boundries, its different. The plate boundries are zones of movement & great crustal activity leading to eg earthquakes, volcanic activity, faulting, folding & mountain building.

The earth's main tectonic plates are

1- Indo Australian plate 2. Eurasian plate 3- African plate 4- Antarctic plate 5- North & South American plate 6- Pacific plate 7- Phillippine plate.

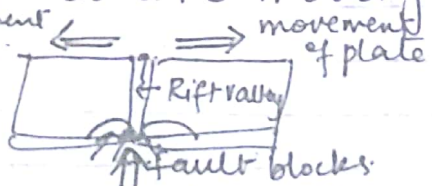
* Types of Plate boundaries:

There are 3 types of plate boundaries

1- Constructive or divergent
2- Destructive or convergent
3- Conservative.

1- Constructive or divergent:

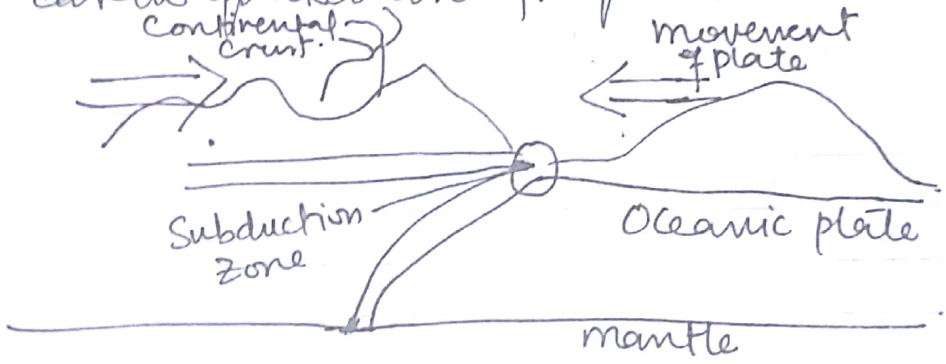
Where two plates are moving apart from each other.



- New magma from the mantle rises to the surface to fill the gap between the moving plate
- It is a runny lava which pours out continously
- This lava form volcanoes
- Rift valleys are formed along faults caused by the crust splitting as two plates move apart.

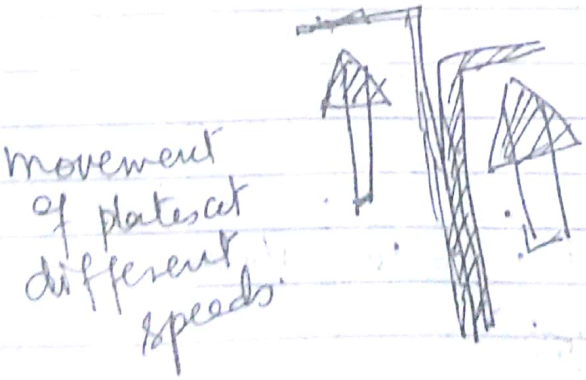
2- Destructive or convergent

When two plates are moving towards each other
- one plate usually oceanic plate sinks below the other. It is destroyed in the sub-duction zone. Sediments on the sea bed are compressed & folded up to form the world's high mountain ranges e.g Himalayas, Andes, Rockies & Alps
- friction from plate movements melt makes the rock melt in the subduction zone.
- This produces magma from which volcanoes are formed. Volcanic eruptions can be violent and earth quakes are frequent.



3- Conservative:

When two plates move against each other
- They may be moving in the same direction but at different speeds. Stresses built up which are released by occassional sudden plate movements. Friction caused by rock rubbing against rocks forms earthquakes



Earthquakes:

Seismographs: The waves caused by earthquake shocks are recorded on sensitive instrument called seismographs. The magnitude of an earthquake is measured on the Richter scale.

Focus: The point of origin of the shock underground is known as the focus; where it reaches the surface is the epicenter. The earthquake is strongest at the epiccentre...

Shock waves fan out from the centre and affect the surrounding area, decreasing in strength as the distance from the epicentre increases.

- Primary effects are those caused by the earthquake shock itself.
- Secondary effects are those that happen in the minutes, hours & days after the earthquake.

Earthquakes & their impacts on people.

Earthquakes occur along every type of plate boundary. Nine out of 10 strong earthquakes occur at destructive boundaries. Strong earthquakes occur at conservative plate margin in California between North American & Pacific plate is known.

- People living in Iran & surrounding countries are in a high risk zone for earthquakes. This is because three huge blocks of the earth's crust push and grind against each other in this part of the world. There are many seismic faults where movement causes earthquakes. This is what happened in Bam, located near the eastern edge of the Iranian block.

* Earthquakes are great killers and cause great human suffering and distress. The local economy can be shattered. People living near to plate boundaries, live in high risk zones. Shock waves have damaged buildings to varying degrees. Broken gas pipes can cause explosions & sparks from damaged electricity cables can cause fires. Water to fight the fires is not available because the water pipes will also have been broken by the earthquake. Disruption to water supplies increases the risks of the spread of diseases such as cholera & typhoid.

Volcanoes: It occurs when magma rises to the surface. Lava pours out of a crater and with time builds up a cone-shaped mountain. This happens at both constructive and destructive plate boundaries.

Volcanic soils are some of the world's most fertile because old lava flows from hundred & thousands of years and weathered to form deep fertile soils here.

Advantages: 1- Minerals such as deposits of Sulphur near the crater

2- Geo-thermal power - using steam from the hot ground to drive turbines and generate electricity 3- heating for homes & offices

4- tourism - such as attractions for visitors such as geysers, hot springs & mud pools

Dis Advantages: People are killed in volcanic eruptions in different ways. Ash & rocks may rain down on top of them.

- Lava flows can be so fast that people don't have time to move out of their path.
- Poisnous gases & fumes may drift over populated areas. • Heat may melt snow on mountain tops, which sets off & mud flows & sweep houses & people away.

Example: The Soufriere Hills Volcano in the Island of Montserrat in the West Indies.

Strategies for Managing the impact of Volcanoes & earthquakes:-

- Preparations are more essential for earthquakes because they occur without warning.
- Volcanoes can give out some warning signs such as • temperature increases in & around the crater • Increased amounts of steam & gases seen coming from the crater.
- Small earthquake shocks felt in surrounding areas.

* One strategy is to employ Scientists to monitor Volcano e.g Mount Etna in Italy * Another strategy is to train & monitor people in emergency procedures.
* New technology is helping Satellites can be used to monitor heat changes, which is useful for Volcanoes in remote locations and in developing countries.
* Another strategy is to train & educate local people in emergency procedures.

(7)

* The size of an earthquake does affect the amount of destruction and the number killed. However, factors which are important are
  - The number of people close to the epicenter.
  - The quality of the construction of buildings
  - How well-prepared the people and emergency services are.

* The best strategy to prevent loss of life in earthquakes is by constructing buildings that can resist earthquakes. (In developing countries earthquake resistant buildings are very expensive)
* Planners can also help by ensuring that factories are not located next to houses. oil tanks can explode & chemical works can catch fire; they need to be away from housing areas for safety. This is called 'land use Zoning'.
* Another strategy is to educate people — get out of doors into an open space / hide under a hard object or team of emergency workers should be trained in Advance (supplies of clean, water & food, medicines) in store for & for emergency situations.

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Soil: Formation, Composition & Uses

Soil: It is the loose material on the earth's surface above the solid rock where plants grow in.

Soil is composed of four basic constituents

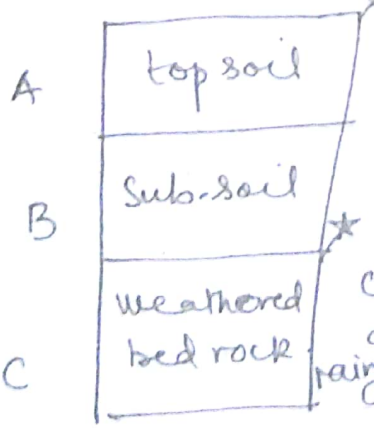
- Organic matter: Living plants & animals & their dead remains & wastes.
- Mineral matter: mainly sand, silt and clay
- Water
- Air

★ Most soils have three layers called horizons. The topsoil ★ is known as 'A' horizon. This gains new materials from the decomposition of trees and plants. However, minerals may be washed out of this layer into horizon below by leaching.

★ The Subsoil is the 'B' horizon. This is where material accumulates from horizons above & below.

★ The bottom is the 'C' horizon. This contains many loose pieces of rock, broken off from the parent rock below by weathering.

The thickness of the soil layer varies greatly from place to place. In the hot wet tropics, where the rocks are weathered & broken down very quickly by heat & rain, the soil may be 10 or more meters deep.



★ Leaching: This is the removal of soluble minerals and organic matter from the topsoil by rain water.

★ Latsol: is the iron-rich red colour soil, poor in organic matter and usually common in wet tropical rainforest areas.

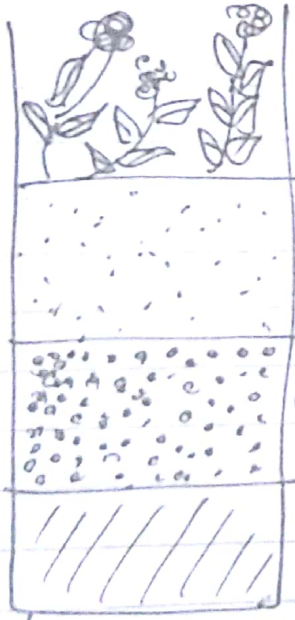
★ All Soils are composed of four elements but the percentages of these constituents are Vary greatly.

★ The large proportion of soil is made up of mineral matter, sand & clay. Proportion of organic material is small but important.

★ Most organic material is supplied on the surface by falling leaves & litter. Millions of soil Organisms including small animals such as earth worm and insects, fungi and microscopic bacteria live in the soil, breaking down plants & animals remains.

★ Decomposed plant material is mixed with the mineral soil near the surface, this is a natural recycling on a massive scale.

★ Half of the soil is not solid, It is made up of air & water roughly in equal part. This is keep on changing depending on the weather. ~~During~~ especially during the wet season proportion of water increases.



Layers of organic matter at the soil surface

★ Fertilizers increase crop yields by putting nutrients into the soil.

★ Pesticides protect crops by killing off insects & Pests.

★ The percentage of Mineral matter is 45%, organic matter 5%, Air & water is 25%.

Mineral Particles, Soil texture and farming opportunities

* Mineral particles are formed by weathering of the rock that lies below the soil
Minerals are distinguished mainly according to particle size.
e.g. (1) Sand grains diameter is 0.05-2.00mm
(2) Silt grains diameter 0.002 - 0.05mm
(3) Clay particles diameter which is usually iron oxides & silicates < 0.002mm

* Texture is the balance of mineral particles in a soil. It is determined by relative percentages of sand, silt & clay in the soil
* (1) Sandy soil consists of 90% sand 5% clay 5% silt
* (2) Clayey soil consists of 25% sand, 45% clay and 30% silt
* (3) Loamy soil consists of 33% sand, 33% clay and 34% silt.
(In loamy soil in which sand, silt & clay are evenly distributed).

Soil texture is important because it affects many factors which influence plant growth & farming.

- Pore space: gaps or spaces between the mineral particles. In sandy soil, there are large pores whereas in clay, they are very small in size.

- Aeration: amount of air present. In sandy soils large pores hold air, in clay air is excluded from tiny pore spaces.
- Drainage: amount of water trapped in pore spaces. Sandy soil do not hold water & it drains freely. water is trapped in clay soil & rain water cannot flow freely.
- Nutrients: ability of the soil to supply nutrients to plants. Nutrients are in short supply in sandy soils, if present, then soon washed out by rain water. clayey soils are rich in nutrients
- Ease of use: how easily they can be ploughed & cultivated. Light sandy & loamy soils are easy to work. clayey soils are difficult to break up even with heavy metal ploughs.

Farming opportunities:

- Loamy soil is best for farming. It retains moisture for plants to use, also allows water to drain during rainfall. It contains clay for holding nutrients and are reasonable easy to work. Their acidity level fall within the range of 5.5 to 8.0 on the PH scale: PH scale:- It measures soil acidity and the concentration of Hydrogen ions in a soil.
- Sandy soils are described as hungry soils because it needs large & frequent feeding of fertilizers.
- Clayey soil (high water content) good for grass growth, but expensive drainage works are needed to allow them to be ploughed & cultivated.

Pg.9. Causes and consequences of Land Pollution

Land pollution from farming

- Salinization: It is the increasing amounts of salt in the topsoil.
- Eutrophication: When the water is starved of oxygen by decomposition of dead algae, a process is known as Eutrophication.

• There are three main types of unmanaged wastes. Farm animal wastes → Residues of farm additives → Run off from urban & paved areas → Acid deposition → Toxic spillages & leakages. All pollute the land & water as well.

Fertilizers & Pesticides are useful ways to increase food output from the land.

Harmful effects of fertilizers & Pesticides.

Nitrates & Phosphates are two common ingredients of fertilizers. Surplus nitrates & phosphates from fertilizers are leached from the soil into underground water supplies. These eventually find their way into surface water courses. Here they enrich the water and encourage the rapid growth of algae. The water is starved of oxygen by decomposition of dead algae & Eutrophication occurs. Result: Insufficient oxygen for other plant & animal life in the water.

Too much use of pesticides not only kills off insects but also other harmless species. This can lead to a great reduction in

the variety of fauna. Indiscriminate use of Pesticides kills vital organisms in the soil as well. The presence of fewer organisms results in a slower rate of decomposition of organic materials. This means a slower release of plant nutrients into the soil and also affects the food chain.

How and Why Salinization occurs

- Concentrated areas of irrigation water on the surface ↓
- Salts are drawn up to the top of the soil as moisture is evaporated ↓
- Further evaporation leaves the salts behind in the topsoil. ↓
- A hard crust of salt is deposited on the surface. ↓
- Salt concentrates around plant roots ↓
- As most plants & crops cannot tolerate high salt levels, they wither & die.

Salinization mostly occurs in the dry areas of the world. The salinization affected areas are the countries of Africa, the Middle East & South Asia.

Percentage of irrigated lands affected by Salinization

10-19·1. Sri Lanka & Jordan
20-29·1. India, Sudan & Iran
30-39·1. Egypt, Syria, Pakistan
40-49·1. Iraq

Dry Climates in these regions means farming only through irrigation water.

Land Pollution from Industries & Urban areas

Land is polluted by Domestic waste, Toxic wastes of industries and Nuclear waste.

Domestic waste

↓

household waste from the preparation of cooking & serving of food

↓

Throwing away of rubbish, cartons & plastic boxes

↓

Ashes from fires → burning rubbish

↓

effects

Sewerage & sanitation systems → frequent outbreak of diseases leads to contamination of both surface & underground water supplies.

Toxic waste

↓

released by Industrial Units → Nickel, lead, mercury, metals smelters, coal burning power stations, Arsenic, Cadmium.

↓

toxic effects of other metals such as iron & steel works, copper, zinc & Chromium.

↓

harmful for human health, if mix in water effects aquatic life → Nitrates & Phosphates mixed naturally in soil & in water (effects both human & marine life)

Nuclear Waste

major issue with nuclear power station → emission of radioactivity & disposal of waste → radioactive substance has 'half life'

→ half life of 8 days. emissions lead to cancer & leukaemia → Plutonium waste is produced