Environmental policies and practices

Unit 6

CLIMATE CHANGE:

- Climate is average of the weather conditions such as rainfall, temperature and wind at a particular point on the earth.
- Climate change is change in average climate that persists over a period of time.
- Worldwide climate change was observed after industrial revolution.
- Burning of fossil fuel, deforestation, agricultural practices, etc have contributed to climate change.
- Effects- increased earth temperatures, droughts, flood and heatwave, rise in sea level, etc.

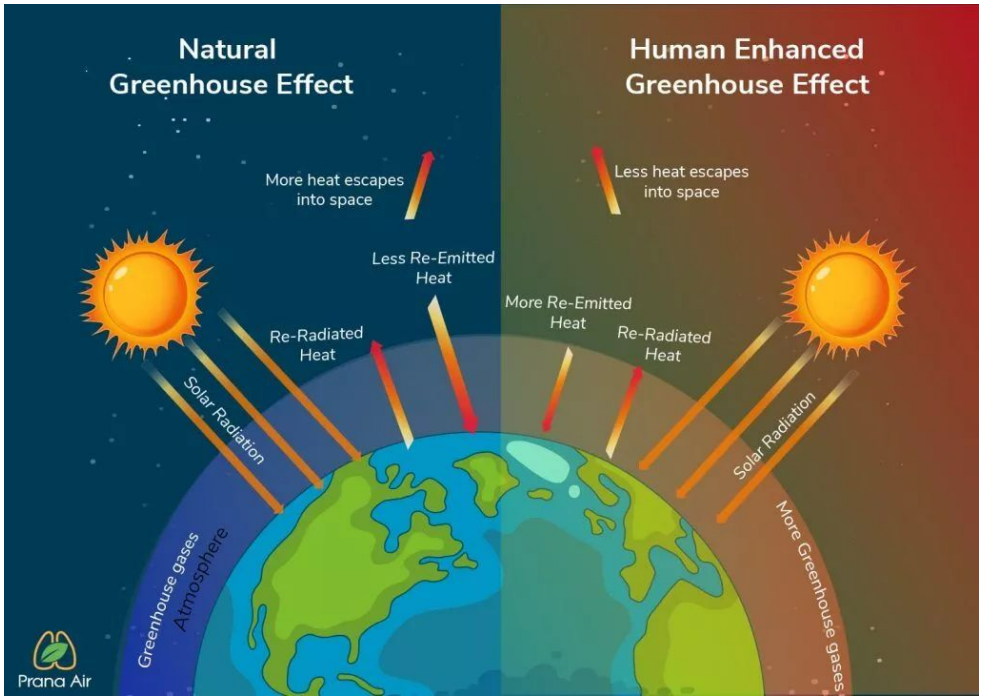
Global warming

Definition- A general increase in average temperature of the earth as a result of increase in concentration of greenhouse gases in air is known as global warming.

Greenhouse gases- Carbon dioxide CO_2, Methane CH_4, Nitrous oxide N_2O water vapour and chlorofluorocarbons (CFCs).

Greenhouse effect- In nature, CO_2, CH_4 and water vapour form a protective blanket of gases around the earth. These gases prevent the sun's solar energy from escaping into the space thereby keeping the earth's atmosphere warm. This helps to sustain life on earth.

Greenhouse effect



https://www.pranaair.com/blog/what-is-greenhouse-effect-its-gases-causes-solution/

Utility of greenhouse effect

https://commons.wikimedia.org/wiki/File:Greenhouse_at_Wilson_Farm,_East_Lexington_MA.jpg

A greenhouse is an enclosure of glass or polythene that is used to grow plants in tropical areas during winter.

Heat trapped by the glass/polythene keeps the temperature inside the greenhouse warm compared to surroundings. This promotes photosynthesis and in turn growth of plants.

In absence of greenhouse gases, Earth would be an icy wasteland.

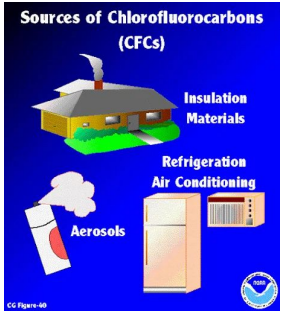
Greenhouse gases keep earth livable by holding onto some of Earth's heat energy so that it doesn't all escape into space.

Causes of greenhouse effect

https://sciencenotes.org/fossil-fuel-examples-and-uses/

1. **Burning of fossil fuels**- fossil fuels like coal, oil and petroleum products produce carbondioxide which is an important greenhouse gas.

2. **CFCs**- main sources of CFCs include air conditioners, refrigerators, industrial solvents, plastic foams, aerosols, propellants, etc.
   These are considered to be more potent than carbon dioxide.
   Trap heat 1500 times more heat per molecule than CO_2.
   Examples of CFCs- dichlorodifluoromethane,
   Carbon tetrachloride, methyl chloroform.



https://prepp.in/news/e-492-chlorofluorocarbons-cfcs-environment-notes

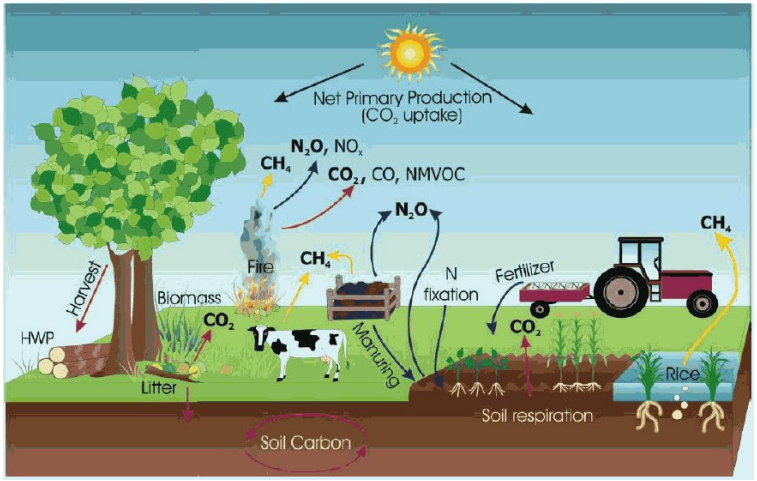
3. Deforestation- Trees absorb CO_2 from the atmosphere during the process of photosynthesis. Some of the largest forests of the earth function as carbon sinks. When the trees are cut down, it increases the concentration of CO_2 in the atmosphere thereby leading to global warming.

https://slothconservation.org/global-warming-climate-change-affect-sloths

https://www.shutterstock.com/search deforestation

4. Mining- minerals are raw materials for construction, transportation and manufacturing. Around 5% GHGs are contributed by mining.

5. Agricultural practices-Activities such as tilling of fields, planting of crops, and shipment of products cause carbon dioxide emissions. Methane emissions from livestock. Livestock are responsible for 14.5% of total anthropogenic greenhouse gas emissions.Traditional rice cultivation is the second biggest agricultural methane source after livestock, with a near-term warming.Nitrous oxide emission comes from the increased use of synthetic and organic fertilizers.

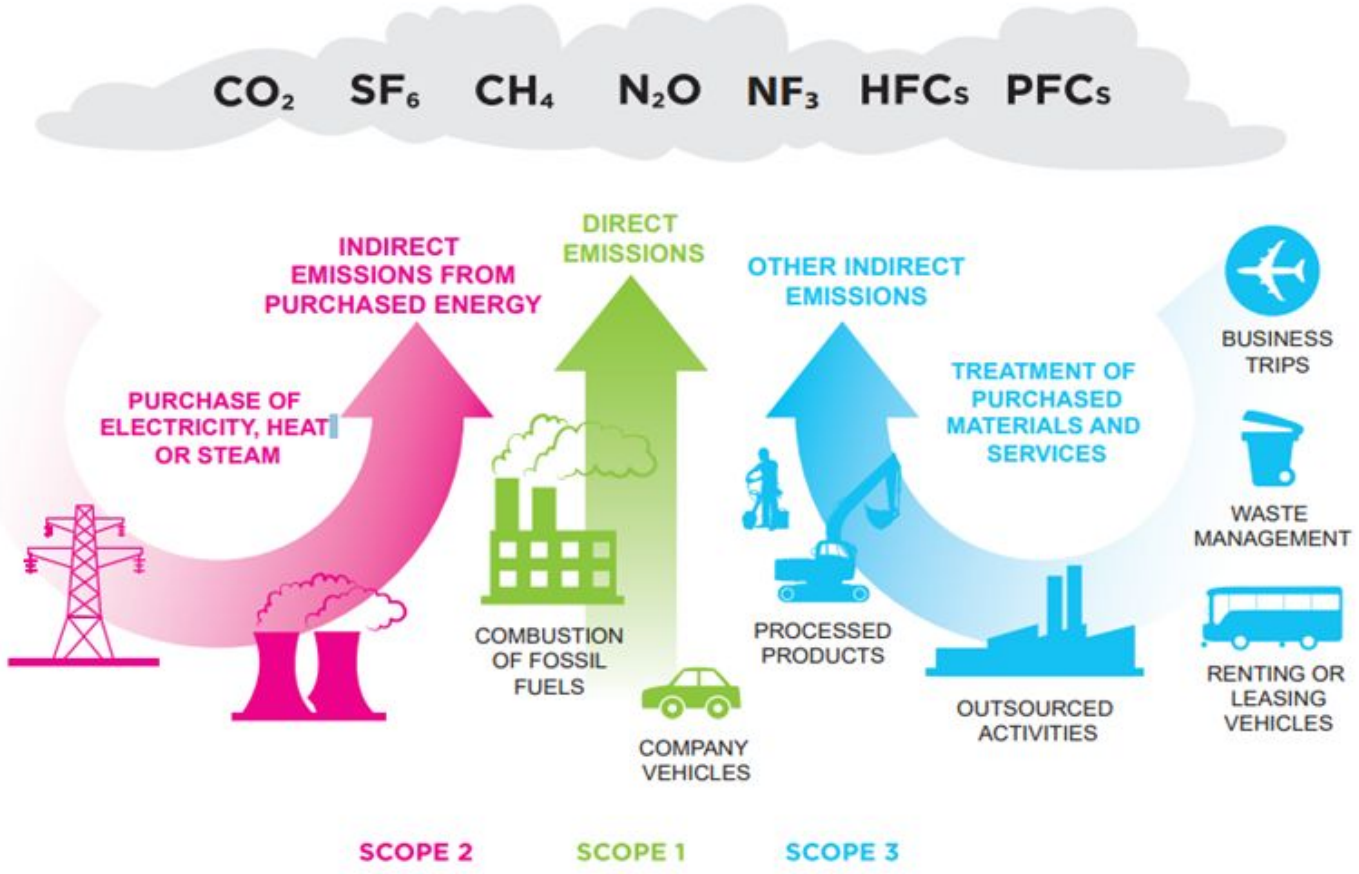


https://farmcarbontoolkit.org.uk/toolkit-page/greenhouse-gas-emissions/

6. Landfills-The most pressing environmental concern regarding landfills is their release of methane gas. As the organic mass in landfills decompose methane gas is released. landfills also produce carbon dioxide and water vapor, and trace amounts of oxygen, nitrogen, hydrogen, and non methane organic compounds.

7. Volcanic eruptions- volcanic carbon dioxide, a greenhouse gas, has the potential to promote global warming.

https://en.wikipedia.org/wiki/Explosive_eruption



https://bioresources.cnr.ncsu.edu/resources/carbon-footprint-measurement-and-management-case-study-of-the-school-forest-enterprise/

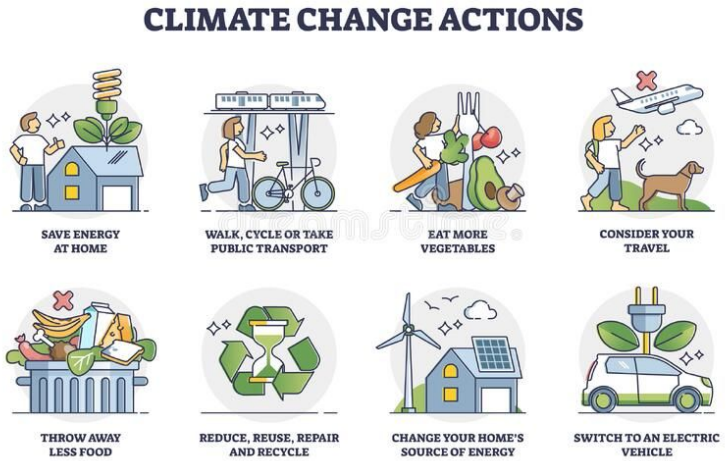
Effects of global warming

- Extreme climatic conditions
- Rising sea levels
- Increased pollution
- Increase in pests in farm
- Destruction of coral reefs
- Forest fires
- Increased instances of disease

https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts

Control measures of global warming

- Afforestation
- Switch to alternative sources of energy sources
- Reuse and recycle principle
- Policy formulation at national level and International level.
- Carbon sequestration

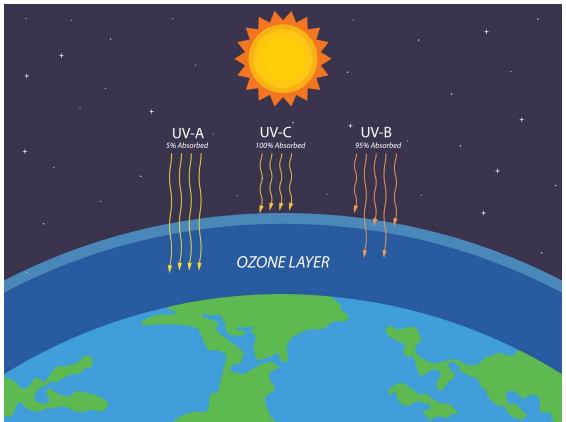


https://www.dreamstime.com/climate-change-mitigation-adaptation-actions-future-outline-diagram-climate-change-mitigation-adaptation-actions-image232379106

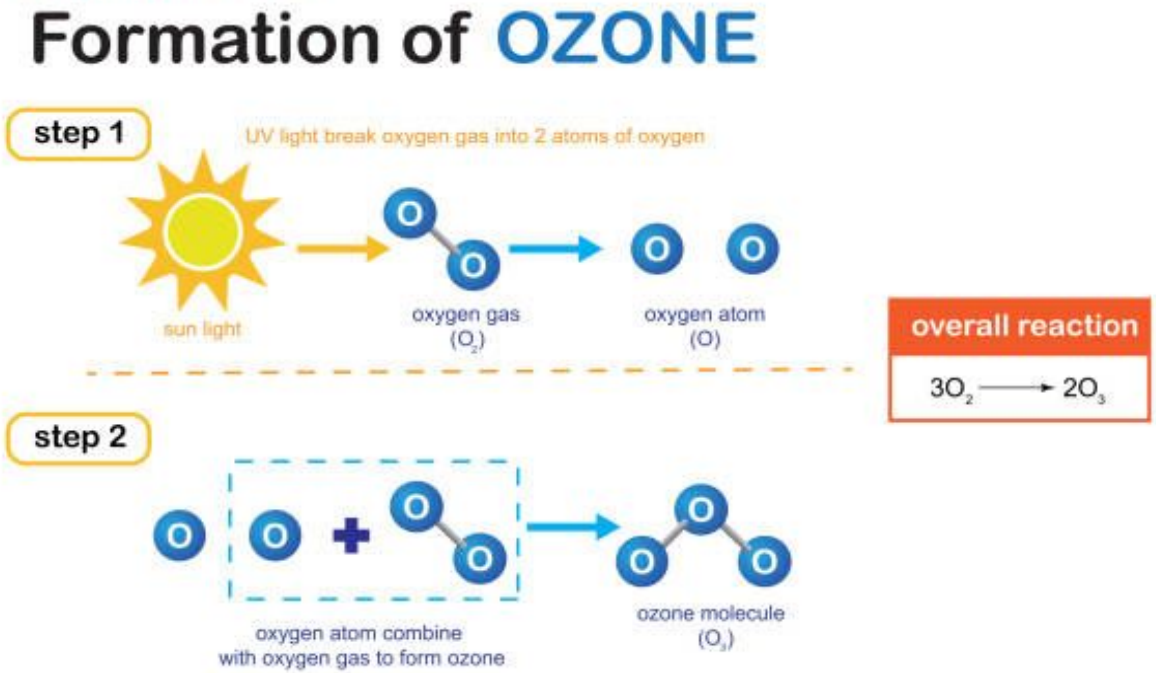
Ozone layer depletion

Ozone layer- it is a thin layer in stratosphere that blocks harmful ultraviolet rays of sun to reach the earth. It extends from 12 to 50 km above the earth's surface.

Ozone layer depletion is thinning of ozone layer by halogens, methane and nitrous oxide that are released by various human activities.



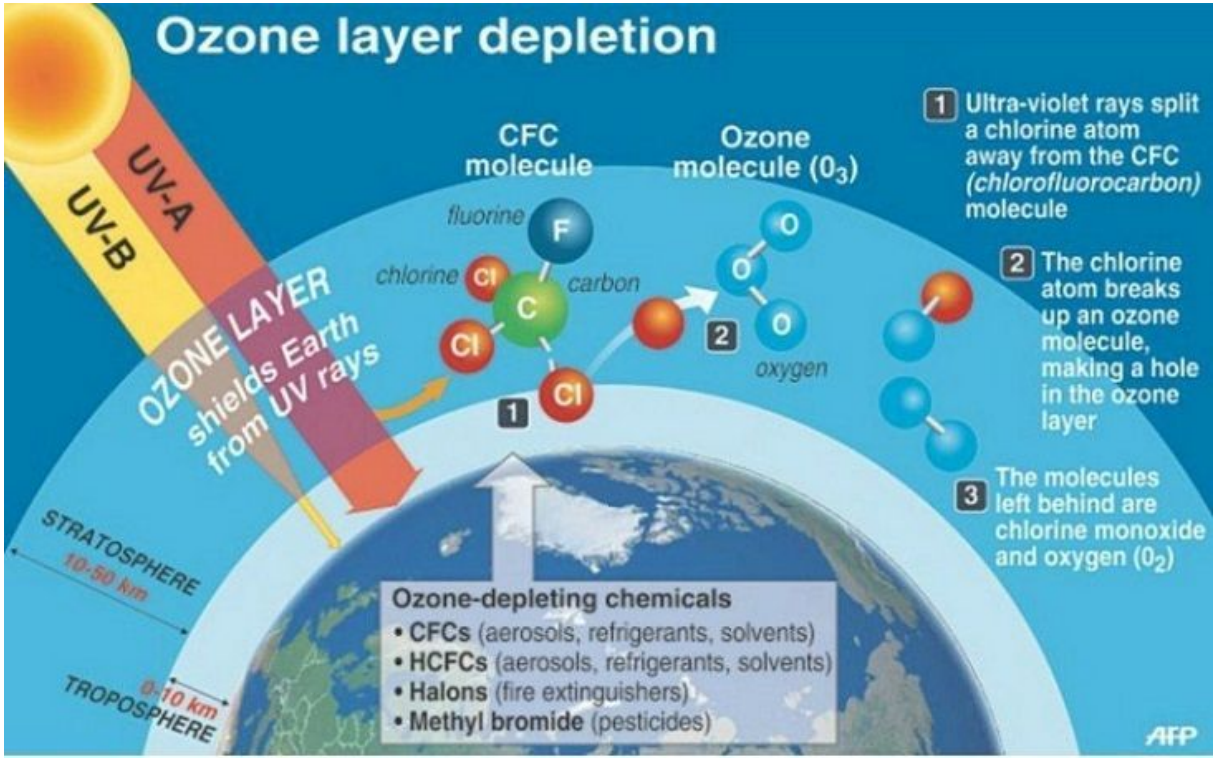
https://www.vecteezy.com/vector-art/12682016-ozone-layer-protection-from-ultraviolet-radiation-ecology-science-illustration



https://www.istockphoto.com/search/2/image?mediatype=illustration&phrase=ozone+layer+illustrations

Causes of ozone layer depletion-

1. **CFCs-** solvents, sprays, aerosols, refrigerators, etc. release CFCs. UV rays break them to release chlorine atom. Chlorine atoms react with ozone and destroy it.
2. **Rocket launch**- propellants used in rockets have CFCs. unregulated rocket launch is associated with ozone depletion.
3. **Nitrogenous compound-** nitrous oxide
4. **Natural phenomena**- natural processes such as stratospheric winds and biogenic emissions of methane and nitrous oxide deplete ozone layer. But is less when compared to anthropogenic cause.



https://www.publichealthnotes.com/ozone-layer-and-its-depletion/

Effects of ozone layer depletion-

1. Human health - increased exposure to UV rays. Skin diseases, cancer, sunburns, etc will become common.
2. Forests- UV B affects physiology and development in plants. Reduced crop yield and forest productivity.
3. Marine life- UV rays are known to affect planktons. This will subsequently affect marine food chain.
4. Degradation of outdoor paints and plastics.
5. Global warming - due to decreased uptake of carbon by plantlife and increase in CFCs.

Control measures of ozone layer depletion

Alternatives for refrigeration sector, foam sector, aerosols and solvents and fire fighting sector.

Use of eco friendly cleaning products

Inhibition of various processes that release nitrous oxides

Use of alternative sources of energy