Course Code:MCC102A
Course Title:Environmental Studies

Lecture No: 20
Title: Social Issues and The Environment

Course Leader : Ms. Priyanka N

Lecture-20
Intended Learning Outcomes

At the end of this lecture, students will be able to

- Define Acid rain, Ozone layer depletion and Green House effect
- Explain green house effects to the environment
- Explain Nuclear Accidents and Nuclear Holocaust
- Discuss effects of acid rain on materials

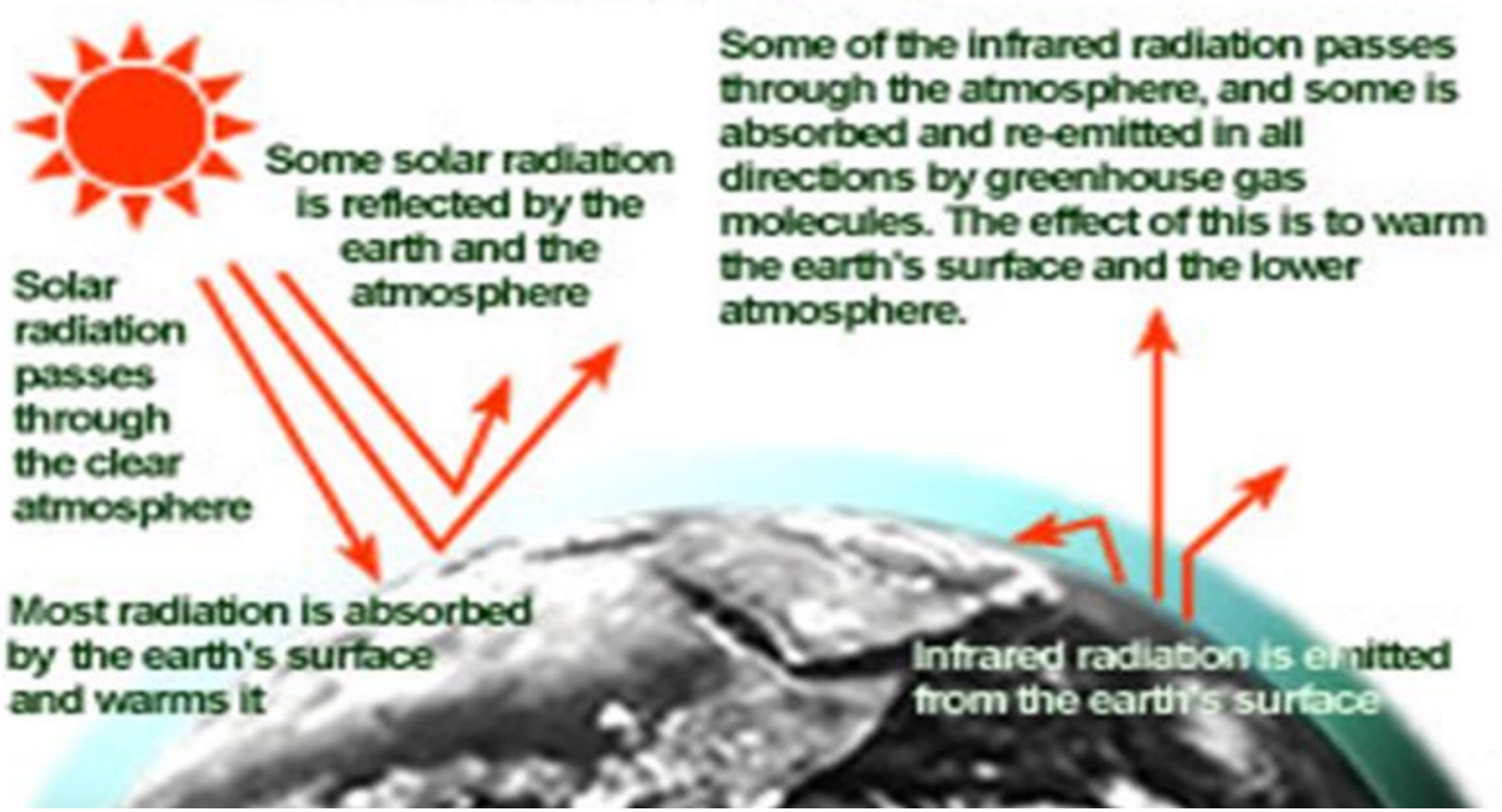
Issues and Possible Solutions

- The conservation ethic and traditional value systems of India
- The ethical basis of environment education and awareness
- The rights of animals
- Preserving resources for future generations
- The need for Gender Equity
- Urban – rural equity issues
- Resource consumption patterns and the need for their equitable utilisation

Greenhouse Gases

- Carbon dioxide
  - Combustion of solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products
- Methane
  - Production and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic wastes in municipal solid waste landfills, and the raising of livestock.
- Nitrous oxide
  - Agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels

The Green House Effect



GHG Emissions Increase

- Since pre-industrial times atmospheric concentrations of CO_2, CH_4 and N_2O have climbed by over 31%, 151% and 17%, respectively.
- Scientists have confirmed this is primarily due to human activity.
- Burning coal, oil and gas, and cutting down forests are largely responsible.

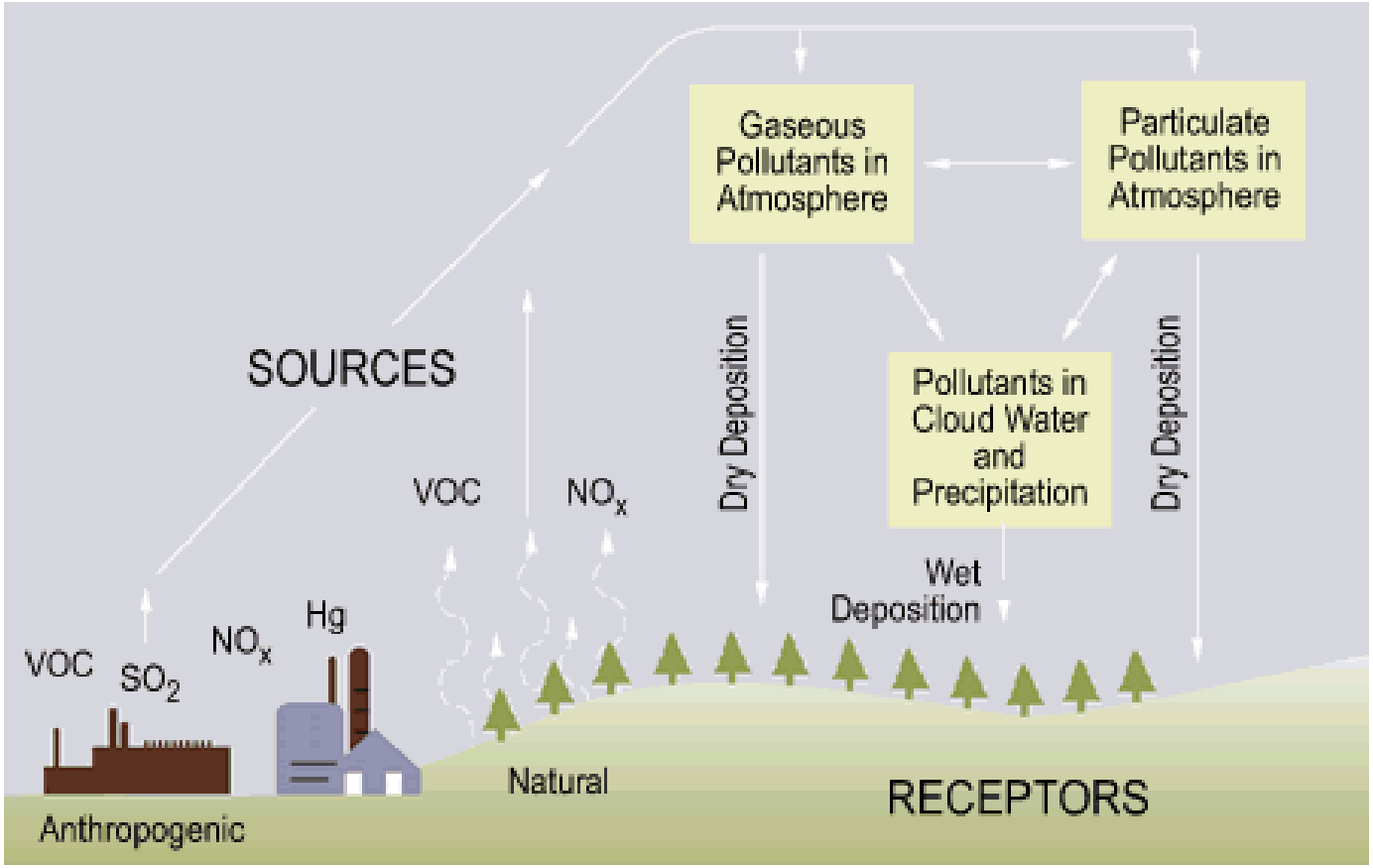
Global Warming

- Cut your utility bills by purchasing energy-efficient appliances, fixtures, and other home equipment and products
- The average house is responsible for more air pollution and carbon dioxide emissions than the average car

Effects

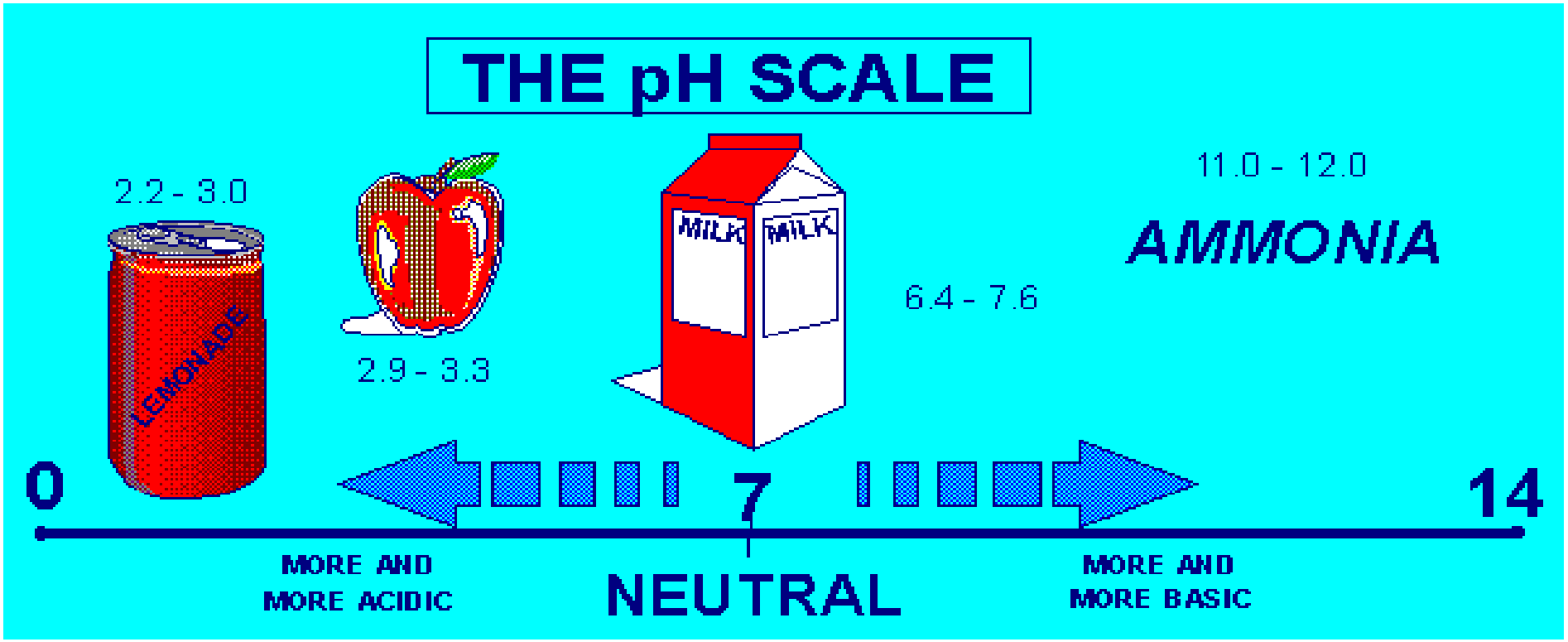
- Health
- Water resources
- Polar regions
- Mountains
- Forests
- Rangelands
- Deserts
- Coastal Zones
- Agriculture
- International

Acid rain

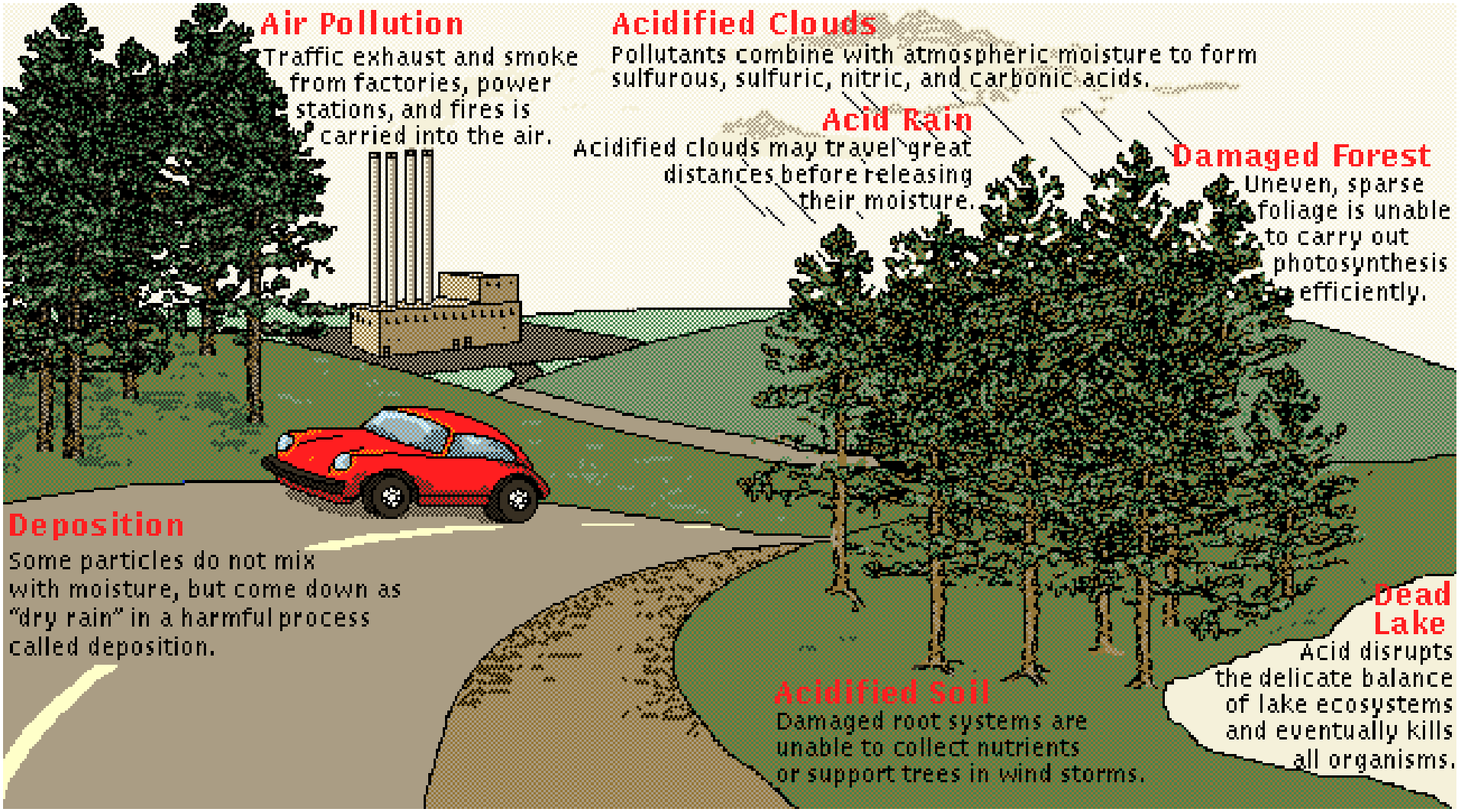


Acid rain is a rain or any other form of precipitation that is unusually acidic, meaning that it possesses elevated levels of hydrogen ions

Acidity- pH Scale



Effects of Acid Rain



Effect on Materials

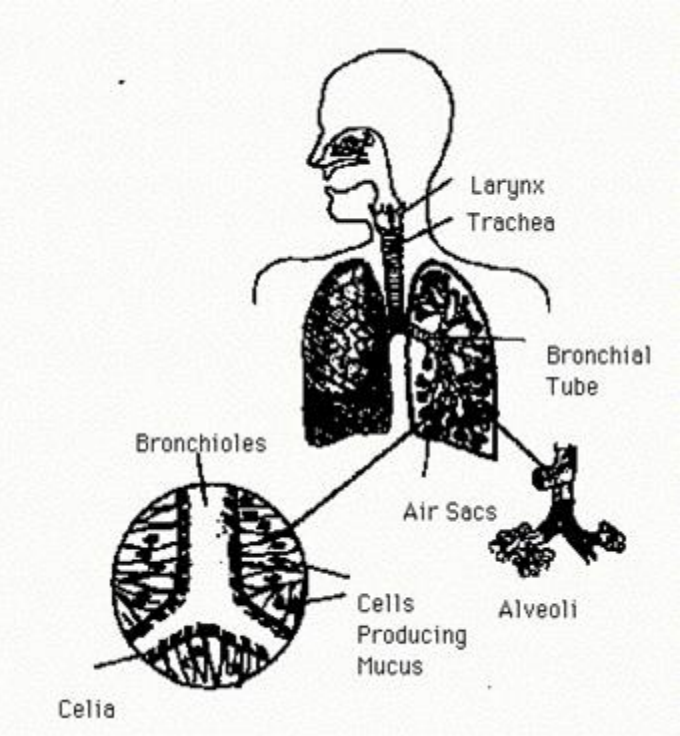
- Acid rain and the dry deposition of acidic particles contribute to the corrosion of metals (such as bronze) and the deterioration of paint and stone

- These effects seriously reduce the value to society of buildings, bridges, cultural objects (such as statues, monuments)

- The right photo, taken in 1969, shows the loss of most of the detail of the statue over 61 years

Effect on Human Health

Elevated levels of fine particles increase illness and premature death from heart and lung disorders, such as asthma and bronchitis

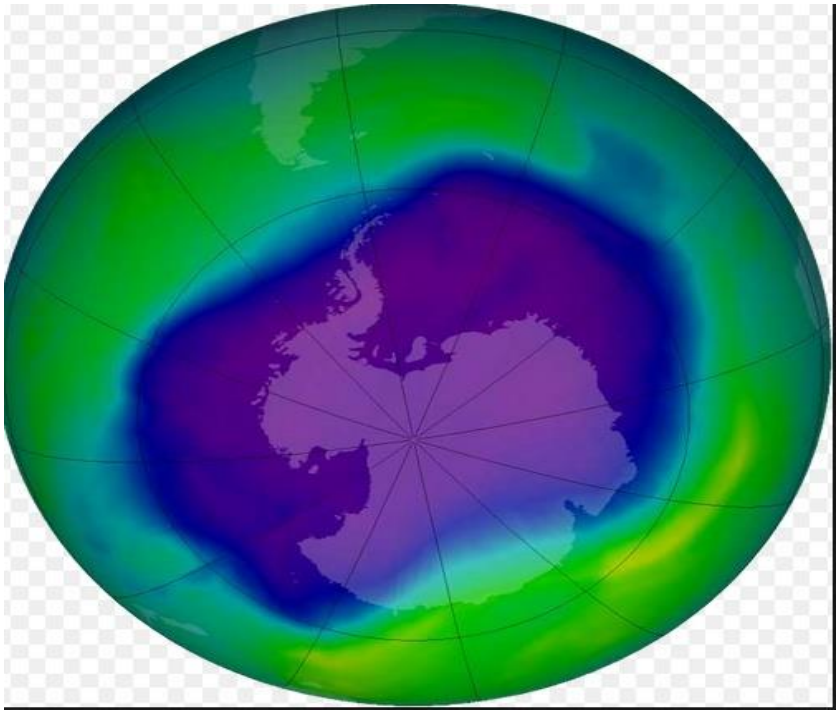


Individual Action

- Turn off lights, computers, and other appliances when you're not using them
- Use energy efficient appliances: lighting, air conditioners, heaters, refrigerators, washing machines, etc.
- Only use electric appliances when you need them.
- Keep your thermostat at 68 F in the winter and 72 F in the summer. You can turn it even lower in the winter and higher in the summer when you are away from home.
- Insulate your home as best you can.
- Carpool, use public transportation, or better yet, walk or bicycle whenever possible
- Buy vehicles with low NO_x emissions, and maintain all vehicles well.

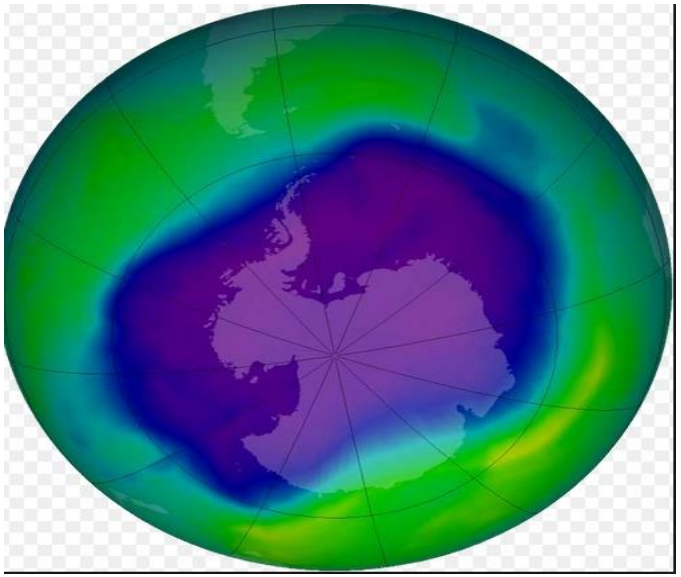
Ozone Layer Depletion

- Ozone is formed by the action of sunlight on oxygen. It forms a layer 20 to 50kms above the surface of the earth.
- This layer in the atmosphere protects life on earth from the dangerous UV radiation from the sun.



Ozone Layer Depletion

- The destruction of the ozone layer is seen to cause increased cases of skin cancer and cataracts.
- It also causes damage to certain crops and to plankton, thus affecting natures food chains and food webs.
- This in turn causes an increase in carbon dioxide due to the decrease in vegetation



Nuclear Accidents

- In 1986 the Nuclear Power Station at Chernobyl in USSR developed a problem that led to a fire and a number of explosions in its Nuclear Reactor.
- An estimated 6.5 lakh people may have been seriously affected.
- They may get cancer, thyroid tumours, and cataracts, and suffer from a lowered immune mechanism.
- As radioactivity passes from grass to herbivores, sheep in Scotland and Reindeer in Lapland were affected and were unfit for human consumption.
- Vegetable, fruit and milk were contaminated in Europe

Nuclear Holocaust

- Nuclear holocaust refers to a possible complete or nearly complete destruction of human life by the use of a large enough quantity of nuclear weapons to produce a Doomsday
- In 1945, the United States dropped atomic bombs in Japan over the towns of Hiroshima and Nagasaki.
- These two atomic bombs killed thousands of people, left many thousands injured and devastated everything for miles around

Wasteland Reclamation

- Degraded land which can be brought under vegetative cover with reasonable effort and which is currently under utilized and land which is deteriorating for lack of appropriate water and soil management or on account of natural causes

Causes of Land Degradation

- Over cultivation
- Deforestation
- Overgrazing
- Improper irrigation practices

Case Study- Land Degradation

- Nagchaund village in Tehri District of Uttar Pradesh was once an eroded and deforested land.
- Through the Jawahar Rozgar Yojana, Soban Singh Bhandari gained immense community support.
- The villagers controlled grazing in the area, undertook plantations for fuel and fodder.
- The moisture content of the area increased and the water sources of the villages were recharged

Consumerism and Waste Products

- Current consumption patterns are depleting non-renewable resources, poisoning and degrading ecosystems, and altering the natural processes on which life depends.
- People in the industrialized countries make up 20% of the world population but consume 80% of the world's resources and produce 80% of wastes.
- Consumerism causes wasteful use of energy and material far beyond that needed for everyday living at a comfortable level.

Case study

Himachal Pradesh was the first State in India to regulate the manufacture and use of plastics. The State proposed a ban on all types of polythene packing.

Consumerism and Waste products

- Reduce, Reuse, Recycle, or the 3Rs principle, is the new concept in waste management.

  The 3R principle of Reduce, Reuse, Recycle, should be followed in that order.

- Reduction is the best option.
- If we reduce at source, there is a smaller chance of waste generation and the pressure on our already stretched natural resources is reduced.
- Reuse is the next best option, as the product is reused in its current form without any energy expended to convert it into a new item.
- Recycling is the last option, as although it converts a waste into a resource, it uses energy to transform that resource into a new useable product.

Consumerism and Waste products

- Several technological breakthroughs have recently been made to recover material from industrial waste such as heavy metals and chemicals such as mercury and nitric acid.
- Thus the waste does not remain a waste product anymore, but becomes a useful resource.

Case Study:

Plastic to oil The Indian Oil Corporation Limited and the Department of Science and Technology are expected to establish India's first plant to convert waste plastic into petrol, diesel and LPG.

Summary

- Acid rain is a rain or any other form of precipitation that is unusually acidic, meaning that it possesses elevated levels of hydrogen ions

- Chlorofluorocarbons and other halogenated ozone depleting substances are mainly responsible for man-made chemical ozone depletion

- Nuclear holocaust refers to a possible complete or nearly complete annihilation of human life by the use of a large enough quantity of nuclear weapons to produce a Doomsday device