FREE NOTES · NCERT + NEET LEVEL

Environmental Issues

Extra reading (old NCERT chapter): air and noise pollution and their control, water pollution, BOD, eutrophication, biomagnification, solid wastes, agrochemicals, radioactive waste, greenhouse effect, ozone depletion, deforestation and people's movements.

01 Air pollution and its control

02 Water pollution, eutrophication, biomagnification

03 Solid wastes, agrochemicals, radioactive waste

04 Greenhouse effect and global warming

05 Ozone depletion, deforestation and people's movements

06 Important Q&A

07 Common mistakes

08 Practice (NEET style)

09 Quick revision

01 Air pollution and its control

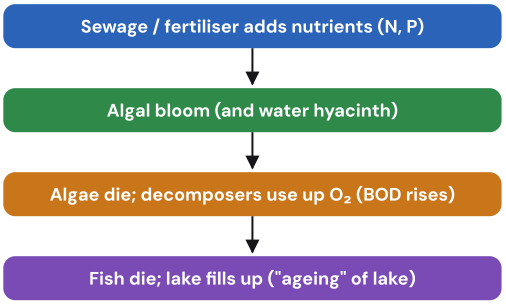
- Harms crops, causes respiratory problems; particulate matter **PM 2.5** (≤2.5 µm) most harmful: enters deep into lungs.
- **Electrostatic precipitator**: removes >99% particulate matter from thermal power plant exhaust. **Scrubber**: removes gases like SO_2 (water or lime spray).
- **Catalytic converter** (platinum, palladium, rhodium): converts unburnt hydrocarbons → CO_2 + H_2O, CO → CO_2, NO → N_2. Needs **unleaded petrol** (lead inactivates catalyst).
- Delhi case study: CNG for public transport (burns efficiently, cannot be adulterated); Euro norms (Bharat Stage) reduce sulphur in fuel. Air (Prevention and Control of Pollution) Act 1981 (noise included 1987).
- **Noise pollution**: >150 dB can damage ear drums; control by sound-absorbing materials, silence zones near hospitals and schools.

02 Water pollution, eutrophication, biomagnification

- Water (Prevention and Control of Pollution) Act 1974. Domestic sewage: suspended solids, colloids, dissolved nutrients; measured by **BOD**.
- **Biomagnification**: increase in concentration of a toxicant (DDT, mercury) at higher trophic levels; it is not metabolised or excreted. High DDT in birds disturbs calcium metabolism ⇒ thin egg shells ⇒ population decline.
- **Cultural (accelerated) eutrophication**: by sewage and agricultural run-off. Water hyacinth (*Eichhornia*) = "terror of Bengal".
- Heated (thermal) waste water from power plants kills temperature-sensitive organisms.
- Arcata (California) case study: integrated waste water treatment using marshes (natural); Friends of the Arcata Marsh (FOAM).
- **Ecosan** toilets (Kerala, Sri Lanka): dry composting toilets; human excreta recycled into fertiliser.



Biomagnification of DDT in an aquatic food chain



Eutrophication

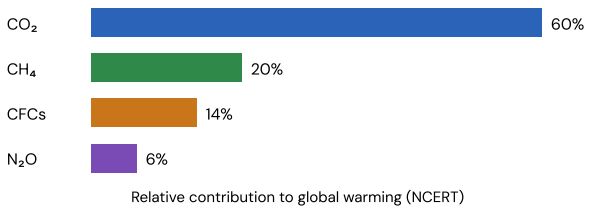
03 Solid wastes, agrochemicals, radioactive waste

- Open dumps breed rats and flies; **sanitary landfills** replace them but can leak chemicals into groundwater. Segregate: biodegradable, recyclable, non-biodegradable.
- **E-waste**: from irreparable computers and electronics; recycling in developing countries often unsafe; metals like copper, iron, gold recovered.
- Plastic road case study: **Ahmed Khan** (Bangalore) developed **polyblend** (fine powder of recycled plastic) mixed with bitumen to lay roads.
- Agrochemicals: pesticides, herbicides, fertilisers ⇒ toxic, biomagnification, eutrophication. **Organic farming** case study: **Ramesh Chandra Dagar** (Sonipat, Haryana): integrated farming; Haryana Kisan Welfare Club.

- Radioactive wastes: mutations, cancer at high doses; should be stored in shielded containers buried ~500 m deep in rocks.

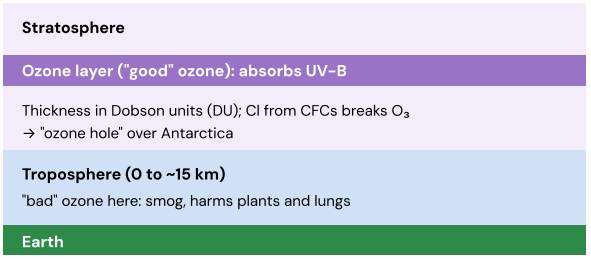
04 Greenhouse effect and global warming

- Natural greenhouse effect keeps earth at ~15 °C (else -18 °C). Excess greenhouse gases ⇒ **enhanced greenhouse effect** ⇒ global warming (~0.6 °C rise in the 20th century).
- Effects: melting polar ice caps and glaciers, sea level rise, odd climate events like **El Niño** (warming of central Pacific).
- Control: cut fossil fuel use, improve energy efficiency, reduce deforestation, plant trees, slow population growth; international agreements.



Greenhouse gases

05 Ozone depletion, deforestation and people's movements



Ozone: good (stratosphere) and bad (troposphere)

- UV-B damages DNA, causes ageing of skin, skin cancer, **snow-blindness** (inflamed cornea), cataract. **Montreal Protocol** (1987, effective 1989) to control ozone-depleting substances.
- **Deforestation**: India's forest cover fell from ~30% to ~19.4% (National Forest Policy 1988 recommends 33% plains, 67% hills). **Slash and burn** (**jhum**) cultivation in north-east. Consequences: more CO_2, loss of biodiversity, soil erosion, desertification, disturbed hydrological cycle.
- **Bishnoi** community (Rajasthan, 1731): **Amrita Devi** and others died protecting khejri trees. Government instituted Amrita Devi Bishnoi Wildlife Protection Award.
- **Chipko movement** (1974, Garhwal Himalaya): local women hugged trees to save them from contractors.
- **Joint Forest Management** (1980s): local communities protect forests and get benefits of forest products.

06 Important Q&A

Q1. Why should catalytic converters use unleaded petrol?

Lead in petrol inactivates the catalyst (platinum, palladium, rhodium).

Q2. Explain biomagnification with an example.

Toxicant concentration increases along food chain; DDT 0.003 ppb in water → 25 ppm in fish-eating birds.

Q3. What is the Chipko movement?

1974 movement in Garhwal Himalaya where village women hugged trees to stop their felling.

07 Common mistakes

- Calling tropospheric ozone useful (it is a pollutant).
- Mixing Montreal Protocol (ozone) with Kyoto Protocol (greenhouse gases).
- Saying biomagnification happens for all chemicals (only for non-degradable ones).
- Thinking greenhouse effect is entirely harmful (natural effect keeps earth warm).

08 Practice (NEET style)

1. Device removing particulates from power plants?
2. Unit of ozone thickness?
3. "Terror of Bengal"?
4. Year of Chipko movement?
5. Largest greenhouse gas contributor?

ANSWERS

1) Electrostatic precipitator · 2) Dobson unit · 3) Water hyacinth (*Eichhornia*) · 4) 1974 · 5) CO_2 (~60%)

09 Quick revision: 5 minutes before the exam

AIR

- ESP >99% particulates
- Catalytic converter: Pt, Pd, Rh
- Delhi CNG

WATER

- BOD, eutrophication
- DDT biomagnification
- Arcata, Ecosan

GLOBAL

- CO_2 60%, CH_4 20%
- Montreal Protocol 1987
- UV-B: snow-blindness

PEOPLE

- Bishnoi, Amrita Devi
- Chipko 1974
- JFM, Dagar, Ahmed Khan

Have a doubt? Ask the AI Doubt Solver at padhaiadda.netlify.app, or take the mock test on this chapter.