

Environmental Issues Notes & MCQs

Pollution · Climate change · Biodiversity · Laws & conventions · Kerala environment ·
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1. Ecology Basics

- **Ecosystem** = living (biotic) + non-living (abiotic) components. Producers → primary consumers → secondary consumers → decomposers.
- **10% law** (Lindeman): only about 10% of energy passes to the next trophic level.
- **Biomagnification**: toxins (DDT, mercury) increase in concentration up the food chain.
- **Biodiversity hotspots** (Norman Myers): 1,500+ endemic plant species and 70% habitat loss. India has 4: **Himalaya, Indo-Burma, Western Ghats & Sri Lanka, Sundaland (Nicobar)**.
- **In-situ** conservation: national parks, sanctuaries, biosphere reserves. **Ex-situ**: zoos, botanical gardens, gene banks, seed banks.

2. Pollution

Type	Key points
Air	Pollutants: SO ₂ , NO _x , CO, particulate matter (PM2.5, PM10), ozone. CO binds haemoglobin (carboxyhaemoglobin). Smog = smoke + fog (London: sulphurous; Los Angeles: photochemical). Measured by AQI .
Acid rain	Caused by SO ₂ and NO _x ; rain with pH below 5.6 . Damages Taj Mahal marble ("marble cancer"), forests, lakes.
Water	BOD = oxygen needed by microbes to decompose organic matter; high BOD = more polluted. Eutrophication = nutrient (N, P) enrichment causing algal bloom and oxygen depletion. Arsenic → blackfoot; fluoride → fluorosis.
Soil	Excess fertilisers, pesticides, plastics, salinisation. Heavy metals enter food chain.
Noise	Measured in decibels (dB) . Long exposure above about 85 dB can damage hearing.
Disasters	Minamata (Japan) - mercury; Itai-itai - cadmium; Bhopal gas tragedy 1984 - methyl isocyanate (MIC).
Plastic / e-waste	Microplastics enter the food chain. E-waste has lead, mercury, cadmium. Follow the 3 Rs: Reduce, Reuse, Recycle.

3. Climate Change & Ozone

- **Greenhouse gases**: water vapour, CO₂, CH₄, N₂O, CFCs, ozone. CO₂ is the largest contributor to human-caused warming; methane is far more potent per molecule.
- **Global warming** effects: sea-level rise, glacier melt, coral bleaching, extreme weather, shifting monsoon.
- **Ozone layer** is in the **stratosphere** and absorbs UV-B. Depleted by CFCs, halons, carbon tetrachloride. Ozone hole is seen mainly over **Antarctica**. Unit: **Dobson Unit**.
- **Carbon footprint** - total GHG emissions of a person/product. **Carbon sink** - forests, oceans.

4. International Conventions

Year	Agreement	Focus
1971	Ramsar Convention	Wetlands (Iran)

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1972	Stockholm Conference	First major UN conference on human environment; World Environment Day (5 June) began
1973	CITES	Trade in endangered species
1987	Montreal Protocol	Phase-out of ozone-depleting substances; Kigali Amendment (2016) – HFCs
1992	Rio Earth Summit	UNFCCC, CBD, Agenda 21
1997	Kyoto Protocol	Binding emission cuts for developed nations (in force 2005)
2015	Paris Agreement (COP21)	Keep warming well below 2°C, pursue 1.5°C; nationally determined contributions

5. Indian Laws & Movements

Year	Law / event
1972	Wildlife (Protection) Act
1973	Project Tiger launched; Chipko Movement (Sunderlal Bahuguna, Chandi Prasad Bhatt)
1974	Water (Prevention and Control of Pollution) Act
1980	Forest (Conservation) Act
1981	Air (Prevention and Control of Pollution) Act
1986	Environment (Protection) Act – enacted after Bhopal
2002	Biological Diversity Act
2010	National Green Tribunal (NGT) established

Article 48A (DPSP) – State to protect environment; **Article 51A(g)** – citizen’s duty to protect and improve the natural environment.

6. Kerala & Environment

Topic	Facts
Western Ghats	UNESCO World Heritage Site (2012). Gadgil Committee (WGEEP, 2011) and Kasturirangan Committee (2013) on Western Ghats protection.
Silent Valley	Palakkad; Kuntipuzha river; saved from a hydel project after the Silent Valley movement; National Park 1984.
Protected areas	Eravikulam – Kerala’s first national park (1978; Nilgiri tahr). Periyar Tiger Reserve – Thekkady. Wayanad, Parambikulam, Neyyar sanctuaries.
Biosphere	Nilgiri Biosphere Reserve (1986) – first in India. Agasthyamala Biosphere Reserve (2001).
Ramsar sites	Ashtamudi, Sasthamkotta, Vembanad-Kol wetlands.
Disputes	Endosulfan tragedy in Kasaragod (aerial spraying on cashew plantations). Plachimada (Palakkad) – groundwater exploitation protest against a cola plant.
Water bodies	Vembanad is the largest lake; Sasthamkotta the largest freshwater lake.

7. Important Days

Date	Day
2 Feb	World Wetlands Day
3 Mar	World Wildlife Day
21 Mar	International Day of Forests
22 Mar	World Water Day

Date	Day
22 Apr	Earth Day
22 May	International Day for Biological Diversity
5 Jun	World Environment Day
16 Sep	World Ozone Day

8. Practice MCQs

Q1. Which gas is mainly responsible for acid rain?

(a) CO₂ (b) SO₂ (c) O₃ (d) H₂

Q2. Acid rain has a pH below:

(a) 7 (b) 6.5 (c) 5.6 (d) 4

Q3. Ozone layer is found in the:

(a) Troposphere (b) Stratosphere (c) Mesosphere (d) Exosphere

Q4. Montreal Protocol deals with:

(a) Wetlands (b) Ozone-depleting substances (c) Whaling (d) Desertification

Q5. Ramsar Convention is related to:

(a) Wetlands (b) Forests (c) Deserts (d) Oceans

Q6. BOD stands for:

(a) Biological Oxygen Demand (b) Basic Oxygen Data (c) Biotic Oxide Density (d) Bio Organic Decay

Q7. Excess nutrients in a lake cause:

(a) Eutrophication (b) Biomagnification (c) Salinisation (d) Acidification

Q8. Bhopal gas tragedy involved:

(a) Chlorine (b) Methyl isocyanate (c) Ammonia (d) Phosgene

Q9. Minamata disease is caused by:

(a) Lead (b) Cadmium (c) Mercury (d) Arsenic

Q10. Paris Agreement was adopted at:

(a) COP3 (b) COP15 (c) COP21 (d) COP26

Q11. Wildlife (Protection) Act was passed in:

(a) 1972 (b) 1980 (c) 1986 (d) 2002

Q12. Environment (Protection) Act was enacted in:

(a) 1974 (b) 1981 (c) 1986 (d) 1991

Q13. Chipko Movement is associated with:

(a) Medha Patkar (b) Sunderlal Bahuguna (c) Baba Amte (d) Anil Agarwal

Q14. National Green Tribunal was set up in:

(a) 2002 (b) 2006 (c) 2010 (d) 2014

Q15. India's first Biosphere Reserve:

(a) Sundarbans (b) Nilgiri (c) Agasthyamala (d) Nanda Devi

Q16. Kerala's first national park:

(a) Silent Valley (b) Eravikulam (c) Periyar (d) Mathikettan

Q17. Which is NOT a Ramsar site in Kerala?

(a) Ashtamudi (b) Sasthamkotta (c) Vembanad-Kol (d) Periyar Lake

Q18. Endosulfan tragedy occurred in:

(a) Palakkad **(b)** Kasaragod **(c)** Idukki **(d)** Wayanad

Q19. World Environment Day is observed on:

(a) 22 Apr **(b)** 5 Jun **(c)** 16 Sep **(d)** 22 Mar

Q20. Article 51A(g) deals with:

(a) Right to life **(b)** Duty to protect environment **(c)** Right to property **(d)** Free education

Answer Key

No.	Answer	Note
1	(b) SO ₂	SO ₂ and NO _x .
2	(c) 5.6	pH < 5.6.
3	(b) Stratosphere	Stratosphere.
4	(b) Ozone-depleting substances	1987.
5	(a) Wetlands	1971, Iran.
6	(a) Biological Oxygen Demand	Measure of organic pollution of water.
7	(a) Eutrophication	Algal bloom, oxygen depletion.
8	(b) Methyl isocyanate	MIC, 1984.
9	(c) Mercury	Mercury.
10	(c) COP21	2015.
11	(a) 1972	1972.
12	(c) 1986	1986.
13	(b) Sunderlal Bahuguna	Began 1973, Uttarakhand.
14	(c) 2010	2010.
15	(b) Nilgiri	1986.
16	(b) Eravikulam	Eravikulam, 1978.
17	(d) Periyar Lake	Periyar is a tiger reserve/lake, not listed among these three.
18	(b) Kasaragod	Kasaragod.
19	(b) 5 Jun	5 June.
20	(b) Duty to protect environment	Fundamental duty.