

Chapter-16
Environmental Issues
Class – XII
Subject –Biology

- 1. What are the various constituents of domestic sewage? Discuss the effects of sewage discharge on a river.**

Answer 1.

Since domestic sewage mainly contains impurities (biodegradable wastes) such as suspended solid (sand, salt, clay), colloidal material (fecal matter, bacteria, plastic and cloth fiber), dissolved materials (nitrate, phosphate, calcium, sodium, ammonia), and disease-causing microbes. The organic wastes from the sewage enter the water bodies; it serves as a food source for micro- organisms such as algae and bacteria. As a result, the population of these micro- organisms in the water body increases. Here, they utilize most of the dissolved oxygen for their metabolism. This results in an increase in the levels of Biological oxygen demand (BOD) in river water and results in the death of aquatic microorganism.

- 2. List all the wastes that you generate, at home, school or during your Trips to other places, could you very easily reduce? Which would be Difficult or rather impossible to reduce?**

Answer 2.

Wastes Generated at Home: It include plastic bags, paper napkin, toiletries, kitchen wastes (such as peelings of vegetables and fruits, tea leaves), domestic sewage, glass, etc.

Wastes Generated at Schools It includes waste paper, plastics, vegetable and fruit peels, food wrappings, sewage etc.

Wastes Generated at Trips: It include plastic, paper, vegetable and fruit peels, disposable cups, plates, spoons etc.

All the above categories of waste generated be easily reduced by the judicious use of the above materials. Wastage of paper can be minimized by writing on both sides of the paper and by using recycled paper. Plastic and glass waste can also be reduced by recycling and re-using. Also, substituting plastics bags with biodegradable jute bags can reduce wastes generated at home, school, or during trips. Domestic sewage can be reduced by optimizing the use of water while bathing, cooking and other household activities.

Micro-organisms do not have the ability to decompose non- biodegradable wastes such as plastic, metal and broken glass

3. Discuss the causes and effects of global warming. What measures need to be taken to control global warming?

Answer 3.

Global warming is naturally occurring phenomenon that is responsible for heating earth's surface and atmosphere. Greenhouse gases include carbon

dioxide, methane, and water vapour. These gases trap solar radiations released back by the Earth. One fourth of the incoming solar radiation is absorbed by atmospheric gases. This helps in keeping our planet warm and thus, helps in human survival. However, an increase in the amount of greenhouse gases can lead to an excessive increase in the Earth's temperature, leading to global warming.

Effects of global warming: During the past century, the temperature of the earth increased by 0.6°C and the average global temperature may increase by 1.4 to 5.8°C by the year of 2100. Global warming is a result of industrialization, burning of fossil fuels, and deforestation. As a result, the natural water cycle has been disturbed resulting in changes in the pattern of rainfall. It also changes the amount of rain water. Also, it results in the melting of Polar ice caps and mountain glaciers, which has caused a rise in the sea level, leading to the inundation of coastal regions.

Control measures for preventing global warming:

- I. Use of renewable source of energy such as CNG etc.
- II. Reforestation.
- III. Reducing the use of fossil fuels
- IV. Use of bio-fuels
- V. Improving energy efficiency
- VI. Recycling of materials

4. Match the items given in column A and B:

Column A

(a) Catalytic converter

Column B

(i) Particulate matter

Biology Class 12th NCERT Solutions



- (b) Electrostatic precipitator
- (c) Earmuffs
- (d) Landfills
- (ii) Carbon monoxide and nitrogen dioxides
- (iii) High noise level
- (iv) Solid wastes

Answer 4

Column A	Column B
Catalytic converter	Carbon monoxide and nitrogen dioxides
Electrostatic precipitator	Particulate matter
Earmuffs	High noise level
Landfills	Solid wastes

5. Write critical notes on the following:

- (a) Eutrophication
- (b) Biological magnification
- (c) Groundwater depletion and ways for its replenishment

Answer 5.

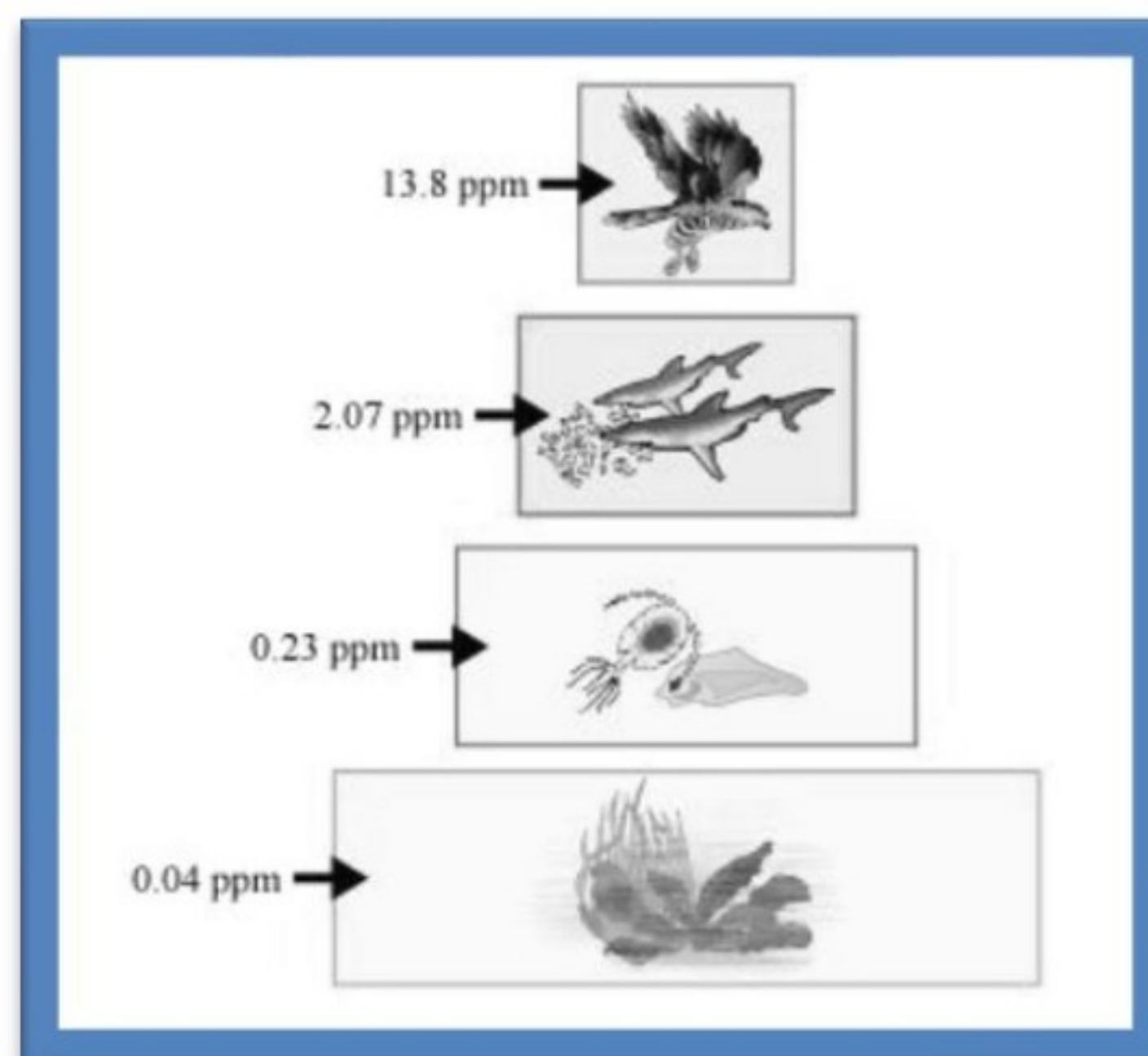
- (a) Eutrophication: Eutrophication refers to the nutrient enrichment in the water bodies leading to lack of oxygen deadening of life-supporting environment.

Because of eutrophication, tremendous increase in the primary productivity of the ecosystem. This leads to an increased growth of algae, resulting into algal blooms. Later, the decomposition of these algae

depletes the supply of oxygen, leading to the death of other aquatic animal life.

(b) Biological magnification: Different varieties of pesticides are used to protect the crops from the several diseases and pests. These pesticides reach the soil and are absorbed by plants with water and minerals from the soil. These chemicals can also enter water sources and into the body of aquatic plants and animals along with rain water. As a result, chemicals enter the food chain. At each trophic level these chemicals get accumulated as they are not biodegradable. The maximum concentration is accumulated at the top carnivore's level. This increase in the concentration of pollutants or harmful chemicals in the tissues of organisms with an increase in the trophic level is called biological magnification.

For example, high DDT concentrations were found in a pond. The producers (phytoplankton) were found to have 0.04 ppm concentration of DDT. Since many types of phytoplankton were eaten by zooplankton (consumers), the concentration of DDT in the bodies of zooplankton was found to be 0.23 ppm. Small fish that feed on zooplankton accumulate more DDT in their body. Thus, large fish (top carnivore) that feed on several small fish have the highest concentration of DDT.



(c) Groundwater depletion and ways for its replenishment: An increase in the population and water pollution the level of ground water has decreased in the recent years and due to this source of water supply is rapidly diminishing each year. To meet the demand of water, water is withdrawn from water bodies such as ponds, rivers etc. As a result, the source of ground water is depleting. This is because the amount of groundwater being drawn for human use is more than the amount replaced by rainfall. An increase in water pollution is another factor that has reduced the availability of ground water.

Measures for replenishing ground water

- i. Preventing deforestation and plantation of more trees
- ii. Preventing over-exploitation of ground water
- iii. Optimizing water use and reducing water demand
- iv. Rain water harvesting

6. Why ozone hole forms over Antarctica? How will enhanced ultraviolet Radiations affect us?

Answer 6.

The ozone formed in the troposphere is called “bad zone” as it harms plants and animals. The ozone formed in the stratosphere is called “good zone” as it acts as shield and absorbs ultraviolet radiation from the sun. The ozone hole is more prominent over the region of Antarctica.

Increased concentration of chlorine in the atmosphere is the main cause of formation of ozone hole. The main source of Chlorine is chlorofluorocarbons (CFC's) widely used as refrigerants. The release of Chlorine atoms causes the conversion of ozone into molecular oxygen.

Around 10,000 molecules of ozone are destroyed by one atom of chlorine which causes ozone depletion. The huge amounts of UV rays reached on the earth because of ozone depletion.

UV -B damages DNA and mutation occurs. It also causes skin darkening and skin cancer. It is lethal for microorganism. High levels of UV-B cause corneal cataract in human beings.

7. Discuss the role of women and communities in protection and conservation of forests.

Answer 7.

Women and communities have played a major role in environmental conservation movements.

A. Case study of the bishnoi community:

In Rajasthan there is a village named as bishnoi village where people strictly believes in the concept of living peacefully with nature. In 1731, the king of Jodhpur ordered his ministers to arrange wood from bishnoi village for the construction of his new palace. Amrita Devi (a bishnoi women) along with her daughter and hundreds of other bishnois showed the courage to step forward and stop them from cutting trees. They embraced the trees and lost their lives at the hands of soldiers of the king. This resistance by the people of the village forced the king to take back the decision of cutting the trees.

B. Chipko movement:

The Chipko movement was started in 1974 in the Garhwal region of the Himalayas. In this movement, the women from the village stopped the contractors from cutting forest trees by embracing them.

8. What measures, as an individual, you would take to reduce environmental pollution?

Answer 8.

To prevent environmental pollution the following initiatives had been taken

Measures for preventing Air pollution:

- Planting more trees
- Use of clean and renewable energy sources such as CNG and bio-fuels
- Reducing the use of fossil fuels
- Use of catalytic converters in automobiles

Measures for decreasing solid waste generation:

- Segregation of waste
- Recycling and reuse of plastic and paper
- Composting of biodegradable kitchen waste
- Reducing the use of plastics

Measures for preventing water pollution:

- Optimizing the use of water
- Using kitchen waste water in gardening and other household purposes
- Filtration of industrial out flow before merging in the rivers

Measures for controlling Noise pollution:

- Avoid burning crackers on Diwali festival
- Plantation of more trees
- Use of acoustic material in the wall of homes located in high sound zone

9. Discuss briefly the following:

- (a) Radioactive wastes
- (b) Defunct ships and e-wastes
- (c) Municipal solid wastes

Answer 9.

(a) **Radioactive wastes:** Radioactive waste are of three types depending upon the amount of radioactivity

- Low level radioactive waste
- Intermediate level radioactive waste
- High level radioactive waste

The main source of radioactive wastes is nuclear industries where generation of nuclear energy takes place from radioactive materials. Radioactive waste contains radioactive rays like α , β and γ rays. These rays cause mutation in organisms, which often results in skin cancer. At high dosage, these rays can be lethal. Safe disposal of radioactive wastes is a big challenge. It is recommended that nuclear wastes should be stored after pre treatment in suitable shielded containers, which should then be buried in rocks.

(b) Defunct ships and e-wastes: Defunct ships are dead ships that are no longer in use. Such ships are broken down for scrap metal in countries such as India and Pakistan. Various toxicants such as asbestos, lead, mercury etc produced from these ships. Ultimately they add solid wastes that are hazardous to health.

As name indicates itself that E-wastes or electronic wastes generally include computers and other electronic goods. Such wastes are rich in metals such as copper, iron, silicon, gold etc. People of developing countries are involved in the recycling process of hazardous metals found in the E-waste and therefore, get exposed to toxic substances present in these wastes.

(c) Municipal solid wastes: — Most of the solid waste generated from schools, offices, homes, and stores comes under municipal solid waste. It is generally rich in glass, metal, paper waste, food, rubber, leather, and textiles. The open dumps of municipal wastes serve as a breeding ground for flies, mosquitoes, and other disease-causing microbes. Hence, it is necessary to dispose municipal solid waste properly to prevent the spreading of diseases.

10. What initiatives were taken for reducing vehicular air pollution in Delhi? Has air quality improved in Delhi?

Answer 10.

Delhi has the fourth rank among most polluted city of the world in a list of 41 cities. Then huge number of vehicles is the main source of air pollution in Delhi. Various steps have been taken to improve the quality of air in Delhi.

1) Introduction of CNG (Compressed Natural Gas): CNG-powered vehicles were introduced at the end of year 2006 to reduce the levels of pollution in Delhi. CNG is a clean fuel that produces very little unburnt particles.

- 1) Removal of old vehicles
- 2) Use of unleaded petrol and low-sulphur petrol and diesel
- 3) Use of catalytic converters
- 4) Implementation of Bharat stage I, which is equivalent to euro II norms in vehicles of major Indian cities.

- Delhi's air quality has improved by the introduction of CNG-powered vehicles and because of this, substantial fall in the level of CO₂ and SO₂ has taken place. But the problem of suspended particulate matter (SPM) and respiratory suspended particulate matter (RSPM) still persists.

11. Discuss briefly the following

- (a) Greenhouse gasses
- (b) Catalytic convertor
- (c) Ultraviolet B

Answer 11.

(a) **Greenhouse gasses:-** The greenhouse effect refers to an overall increase in the average temperature of the Earth due to the presence of greenhouse gases. Global warming is naturally occurring phenomenon that is responsible for heating earth's surface and atmosphere. Greenhouse gases include carbon dioxide, methane, and water vapour. These gases trap solar radiations released back by the Earth. One fourth of the incoming solar radiation is absorbed by atmospheric gases. This helps in keeping our planet warm and thus, helps in human survival. However, an increase in the amount of greenhouse gases can lead to an excessive increase in the Earth's temperature, leading to global warming.

(b) **Catalytic convertor:-** A catalytic converter is a device used to reduce the emissions from an internal combustion engine. These devices contain expensive metals such as platinum, palladium, and rhodium that act as catalysts. As the vehicular discharge passes through the catalytic converter, the unburnt hydrocarbons present in it get converted into

- Carbon dioxide and water. AND

Carbon monoxide and nitric oxide released by catalytic converters are converted into carbon dioxide and nitrogen gas (respectively).

(C) **Ultraviolet B:-** Ultraviolet-B is an electromagnetic radiation which has a shorter wavelength than visible light. It is a harmful radiation that comes from sunlight and penetrates through the ozone hole onto the Earth's surface. It induces many health hazards in humans. UV -B damages DNA and

activates the process of skin ageing. It also causes skin darkening and skin cancer. High levels of UV-B cause corneal cataract in human beings

cbse.jagranjosh.com