

NCERT Solutions For Class 12 Biology Chapter 16 Environmental Issues

Q1. What are the various constituents of domestic sewage? Discuss the effects of sewage discharge on a river.

Answer:

Domestic sewage refers to the wastewater coming from toilets, kitchen and washings which is passed into sewer systems. Domestic sewage contains fibrous matter, grit, colloidal particles, faecal matter, small sized food leftovers, pathogens, nitrates, phosphates and other salts etc.

The effects of sewage discharge on a river

1. Sewage discharge causes a rise in BOD or biological oxygen demand thus reducing the amount of dissolved oxygen in the river
2. Sewage discharge causes the disappearance of fishes and some other aquatic animals in the river
3. Water becomes turbid, odorous and unfit for human drinking

Q2. List all the wastes that you generate, at home, school or during your trips to other places. Could you very easily reduce the generation of these wastes? Which would be difficult or rather impossible to reduce?

Answer:

In our daily life, we generate a lot of waste at our home, schools, during trips etc.

1. Waste generated at homes- waste paper, old clothes, leather articles, broken crockery, cartons, food leftovers, kitchen wastes etc.
2. Waste generated in schools- paper, discarded pencils, pen refills, cardboards, polythene bags, fruit peels, wrappers etc.
3. Waste generated during trips- papers, plastic bags, bottles, old clothes, leftover fruits and other eatables, cartons, food wrappers, aluminium foils, plastic glasses, thermocol plates and glasses.

Among these waste products, the electronic wastes, crockery, glass item, plastic items, metal cans, polythene carry bags, pet bottles etc an not be reduced. In fact, they are difficult or rather impossible to reduce. They can be sorted by recycling them or dumping them in open landfills. On the other hand, the paper pencil wastes, food items, etc can be easily reduced by dumping them as they are biodegradable and get degraded by decomposers wit time.

Q3. Discuss the causes and effects of global warming. What measures need to be taken to control global warming?

Answer:

Global warming- The rise in the mean temperature of the earth is called global warming.

Causes of global warming- Global warming is mainly caused due to the increased amounts of greenhouse gases in the atmosphere. These gases allow long wave radiations to enter into the atmosphere but do not let them leave, so these radiations remain trapped in the atmosphere and cause the mean temperature to rise. This is

similar to the effect of glass walls in a greenhouse on the plants. The main greenhouse gases are:

1. Carbon dioxide- 60% of global warming is caused by carbon dioxide. The atmospheric concentration of carbon dioxide has risen to 280 ppm in 1750 to 380 ppm in 2007 and until 2019 it has risen to above 400. The main reason for the increase in the combustion of fossil fuels and deforestation.
2. Methane- It contributes to 20 % of global warming. The main reason for increase includes incomplete combustions, anaerobic decomposition, chimneys, paddy fields etc.
3. Chlorofluorocarbons- These are compounds of carbon and halogens used as propellants in aerosols, refrigerants, fire extinguishers, plastic foams, jet fuels etc.
4. Nitrous oxide- they are responsible for causing 6 % of global warming. It is formed during the combustion of nitrogen-rich fuels.

Effects of global warming

1. Melting of snow- Due to the increase in global temperature, the polar ice caps and snow mountains will start melting.
2. Sea level- Due to the melting of snow, the sea level will rise leading to submerging of coastal areas.
3. Odd climatic changes- Global warming will lead to odd climatic changes such as a reduction in precipitation, rise in El Nino effect, more floods and droughts, change in the global air current etc.

4. Vegetation- Forest will be turned into scrub vegetation, tropic will have more deserts.

5. Food production- Global warming may lead to a reduction in food production.

Measures to control global warming

1. Reduction in CFCs production

2. Increase in forest areas

3. reduction in the exploitation of fossil fuels

4. Checking population growth

Q4. Write critical notes on the following: (a) Eutrophication

Answer:

Eutrophication- The term eutrophication is used to refer to the excessive growth of algae, plants and animals in water bodies due to the nutrient enrichment of the water body with nitrogen and phosphorous. Eutrophication can be natural or accelerated. In the case of natural eutrophication, natural ageing causes nutrient enrichment of the water body. This is a slow process that is not detectable in a human lifetime. A young water body has clear, cold water with no nutrient enrichment. The nutrients are added via runoff and streams draining into it. Gradually the water becomes shallower and warmer. Due to this, marsh plants grow in it, floating plants appear. The waterbody is gradually filled upon the shores and changed into the land mass. In cultural or accelerated eutrophication, nutrient enrichment is due to human activities like the passage of sewage, industrial effluents and run-off rich nitrated and phosphates from

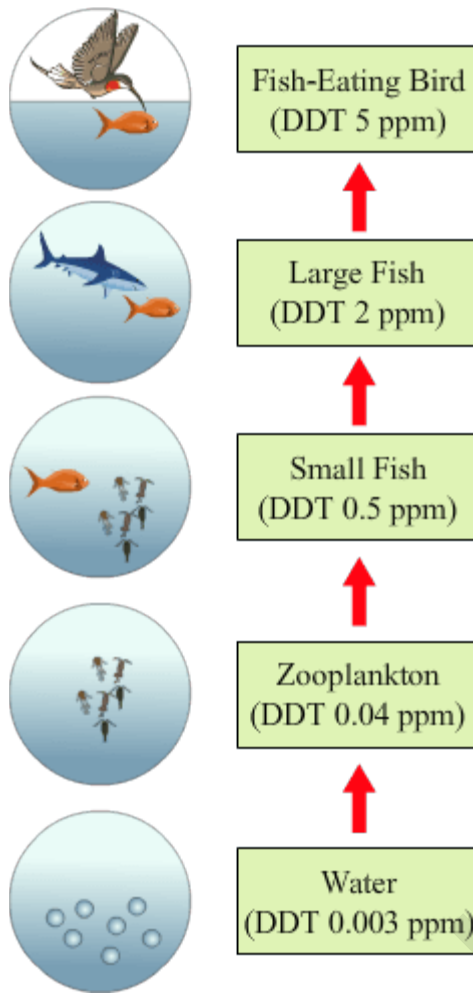
fertilised fields. These nutrients cause dense growth of plants and planktonic algae over the water body.

Q4. Write critical notes on the following:

(b) Biological magnification

Answer:

Biological magnification- It refers to the increase in the concentration of a persistent chemical with the rise in trophic level. The chemical becomes hazardous when its concentration becomes very high. For example, a DDT concentration of 0.003 ppb becomes 0.003 ppm in phytoplankton, 0.04 ppm in zooplankton, 0.5 ppm in small fish, 2.0 ppm in larger fish and 5 ppm in fish-eating birds.



Q4. Write critical notes on the following:

(c) Groundwater depletion and ways for its replenishment

Answer:

Groundwater depletion and ways of its replenishment-

Groundwater is being pumped out at an enormous rate for its use in agricultural and urban areas resulting in the fall of the water table by 10 m to 30m and depletion of groundwater.

Ways of replenishment of groundwater

1. Rainwater harvesting- The rainwater can be preserved and through this, groundwater is recharged.

2. Sprinkler and sub-surface irrigation techniques- This techniques leads to a reduction in the amount of groundwater used for irrigation.

3. Afforestation

Q5. Match the items given in column A and B:

Column A	Column B
a.Catalytic converter	i. Particulate matter
b.Electrostatic precipitator	ii. Carbon monoxide and nitrogen oxides
c.Earmuffs	iii. High noise level
d. Landfills	iv. Solid Wastes

Answer:

The correct matching is as follows:

Column A	Column B
Catalytic converter	Carbon monoxide and nitrogen oxides

Electrostatic precipitator	Particulate matter
Earmuffs	High noise level
Landfills	Solid Wastes

Q6. Why does ozone hole form over Antarctica? How will enhanced ultraviolet radiation affect us?

Answer:

The countries like USA, Japan, and other European countries, emit a lot of ozone-depleting substances such as *CFCs, N₂O, halons, SO₂, CH₄, C₂H₆*. These chemicals are released in the stratosphere and they drift towards poles before the onset of winters. During winter, ice clouds are formed over Antarctica with no sunrise. It catalyses the release of Cl from CFCs. During springs, the Cl reacts with ozone and convert it into free oxygen causing depletion of ozone and formation of the ozone hole.

Effects of enhanced UV radiations

1. Snow blindness
2. Inflammation of cornea
3. Damage of skin cells and development of skin cancer
4. Increased incidence of herpes

5. Damage to nucleic acids and proteins

6. Increased blindness in animals

7. Reduced immunity

8. Reduction in photosynthesis

Q7. Discuss the role of women and communities in protection and conservation of forests.

Answer:

The role of women and communities in the protection and conservation of forests can be understood by following two case studies:

1. Bishnoi community- The Bishnoi community in Bishnoi village of Rajasthan fought with the king and his army for the protection of trees. Amrita Devi a woman of Bishnoi lead this movement and with her daughter and hundreds of other members of her community, embraced the trees and lost their lives in the hands of soldiers. Ultimately the king had to drop this idea of cutting trees for his palace.

2. Chipko movement- In 1974, in the Garhwal region of Himalayas, the Chipko movement was started. During this movement, the villagers hugged the trees and stopped contractors to cut the trees.

Thus, by means of these two case studies, we can conclude that women and social communities have a very large role to play in the prevention of forests.

Q8. What measures, as an individual, would you take to reduce environmental pollution?

Answer:

The following measures can be taken to reduce environmental pollution

1. Planting more number of trees
2. we can reduce the use of fossil fuels by not using our own vehicles to travel short distances.
3. We should use clean fuel such as CNG in our cars which environment-friendly as well as pocket-friendly.
4. We must segregate the wastes into biodegradable and non-biodegradable waste products. So that wastes can be easily sorted out
5. Encourage the practice to reduce, reuse, recycle
6. We must use catalytic converters in vehicles.
7. We should avoid burning crackers
8. Reduce the use of plastics. We can replace plastic bags with jute bags.

Q9. Discuss briefly the following:

(a) Radioactive waste

Answer:

Radioactive Wastes-

These waste products include nonusable discards that possess radioactivity. Radioactive wastes are of three types-

1. Wastes with low-level radioactivity- Include coolant water of atomic reactors, pond water for cooling spent fuel in reactors etc. They emit very small amounts of radioactivity. Irradiation centres, radiotherapy units and laboratories also produce wastes with low radioactivity
2. Wastes with an intermediate level of radioactivity- These include radioactive wastes of many ores which are separated during refinement of minerals.
3. Wastes with high level of radioactivity- spent fuel of atomic reactors and leakage from reactors have a very high level of radioactivity.

The radioactive wastes have to be handled very carefully and should be dumped 500 m deep in the earth or inside sea after placing them inside very thick protective closed containers. These wastes are highly dangerous to human beings, animals, microorganisms etc. High doses cause mutations and they can even be lethal.

Q9. Discuss briefly the following:

(b) Defunct ships and e-waste

Answer:

Defunct ships and e-wastes-

The dead ships which are not in use are called defunct ships. Defunct ships can be broken down for scrap metal in some countries. Defunct ships can act as a source of heavy metals such as asbestos, lead, mercury etc. E- wastes also called electronic

wastes include waste products generated from electronic goods such as computers, televisions, refrigerators etc. Such wastes are highly toxic and can pose serious threats to humans and animals.

Q9. Discuss briefly the following:

(c) Municipal solid waste

Answer:

The solid waste generated from schools, offices, homes, stores etc is known as municipal solid wastes. The municipal solid waste includes glass, food articles, plastics, stationery, rubber, leather, textiles etc. The municipal solid waste is necessary to dispose of as it acts as a breeding site for mosquitoes thus leading to diseases like dengue, malaria etc. The methods used for safe disposal of solid wastes include sanitary landfills and incineration.

Q10. What initiatives were taken for reducing vehicular air pollution in Delhi? Has air quality improved in Delhi?

Answer:

Delhi is considered to be one of the most polluted cities. The major reasons of Delhi being polluted include increased fossil fuel consumption, increased number of industries etc. Government has taken several steps in order to minimise the vehicular air pollution. Some of these steps are as follows:

1. Introduction of CNG- The supreme court of India in the year 2006, in order to reduce the air pollution, decided that all the public transports such as buses, autos etc will have CNG i.e. compressed natural gas. This is a clean fuel that spreads less pollution.

2. Use of unleaded petrol and non-sulphur petrol and diesel.
3. Phasing out of old vehicles because they cause more pollution.
4. Use of catalytic converters in the automobiles.
5. Implementation of BHARAT stage I in order to control pollution levels

All these steps led to a reduction in the pollution levels in Delhi. The air quality has improved after this as there is a fall in carbon dioxide and sulphur dioxide.

Q11. Discuss briefly the following :

(a) Greenhouse gase

Answer:

Greenhouse gases-

The gases which cause the greenhouse effect are called greenhouse gases e.g. carbon dioxide, methane, chlorofluorocarbons, nitrous oxide etc. Greenhouse gases allow long wave radiations to enter into the atmosphere but do not let them leave, so these radiations remain trapped in the atmosphere. This causes the greenhouse effect. This is similar to the effect of glass walls in a greenhouse on the plants. The contribution of carbon dioxide, methane, chlorofluorocarbons, nitrous oxide in causing global warming is 60%, 20%, 14% and 6% respectively.

1. Carbon dioxide- The atmospheric concentration of carbon dioxide has risen to 280 ppm in 1750 to 380 ppm in 2007 and until 2019 it has risen to above 400. The main reason for the increase in the combustion of fossil fuels and deforestation.

2. Methane- The main reason for increase includes incomplete combustions, anaerobic decomposition, chimneys, paddy fields etc.

3. Chlorofluorocarbons- These are compounds of carbon and halogens used as propellants in aerosols, refrigerants, fire extinguishers, plastic foams, jet fuels etc.

4. Nitrous oxide-It is formed during the combustion of nitrogen-rich fuels.

Q11. Discuss briefly the following : (b) Catalytic converter

Answer:

Catalytic converter

Catalytic converter refers to a device containing platinum, palladium and rhodium that is fitted in the automobiles. The major functions of catalytic converters in the automobile are

1. Complete oxidation of unburnt hydrocarbons
2. Oxidation of carbon monoxide into carbon dioxide
3. Conversion of nitrogen oxides into nitrogen

While using catalytic converters, we must not use gasoline with lead as lead inactivates the catalysis of converter .

Q11. Discuss briefly the following : (c) Ultraviolet B

Answer:

Ultraviolet- B

The part of ultraviolet radiation having a wavelength of 280-320 nm. UV-B is harmful to organisms. The ozone layer in the stratosphere absorbs 50% of total UV-B. Due to depletion of ozone, mostly UV-B radiations reach the Earth. In humans, UV radiation causes snow blindness, cataract, skin cancer, skin ageing, mutations etc.

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