

QUESTION: 6

ANSWER:

Introduction

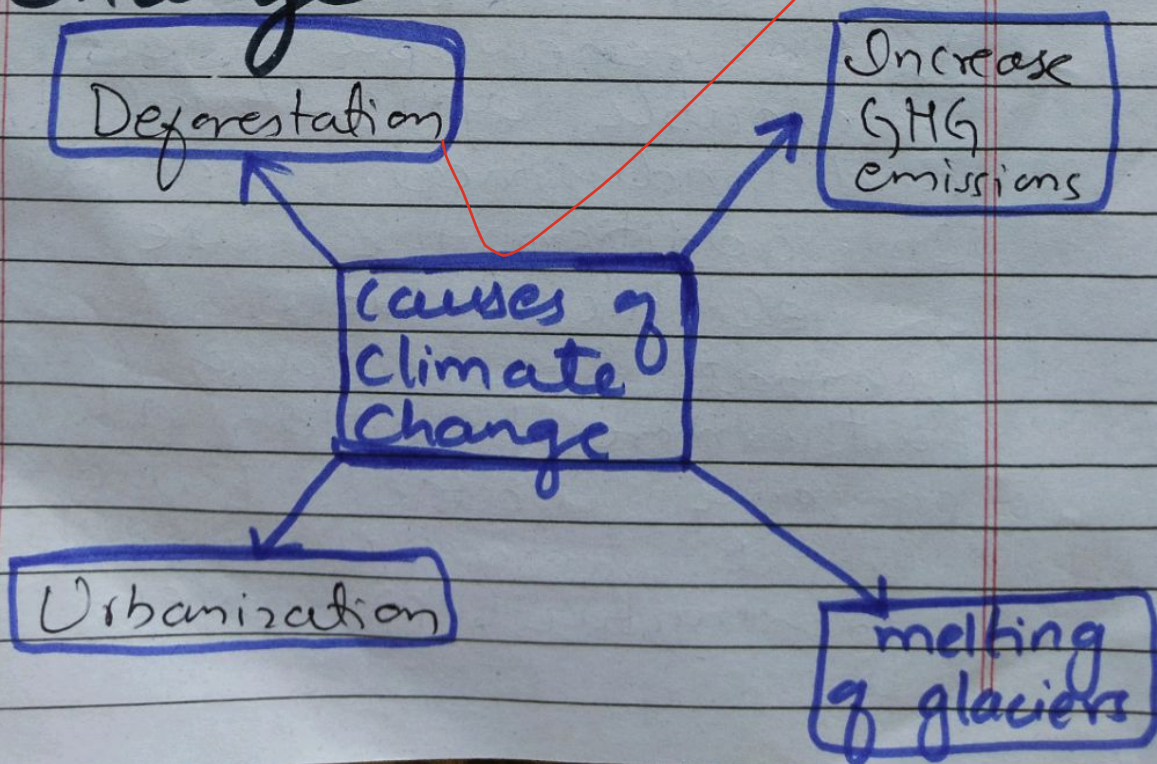
Climate change is a global problem that threatens the lives of billions of people around the world. Pakistan is one of the few countries badly affected by climate change. Pakistan should adopt measures to mitigate the risks related to climate change. These adaptation measures include use of renewable energy, sustainable agricultural, and industrial practices. In addition, the use of electric vehicles to combat Green House Gases. Furthermore, Pakistan should conserve water, build climate proof sustainable infrastructure. Moreover,

Pakistan should increase green cover and adopt circular economy practices.

Climate Change:

As per International Panel on climate change (IPCC), "Climate change is increase in the temperature of the earth which has adverse impacts on humans and the surrounding environment."

Causes of Climate Change



1) Deforestation fuels climate change

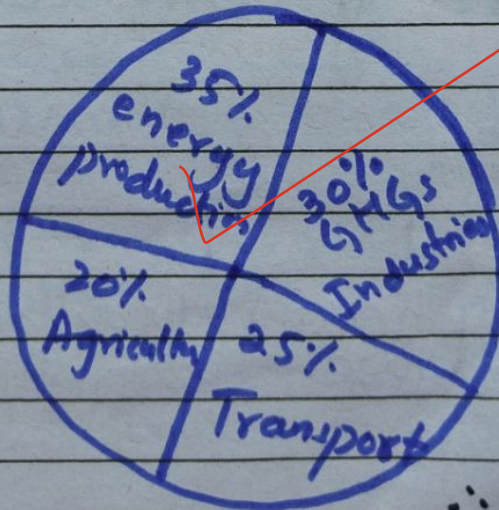
Trees act as carbon sinks. Deforestation leads to increase carbon dioxide in atmosphere.

As per the Global Forest Watch, "18 Mha of land has undergone deforestation".

2) Increase Green house gases emissions!

GHG emissions are the primary cause of climate change.

These gases increase the temperature of earth and cause climate change.



∴ IPCC estimate

3) Urbanization:

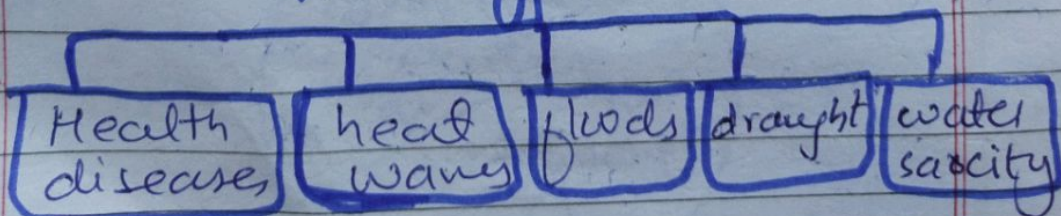
Urbanization also leads to climate as people start to settle in cities. As per the UN, "By 2030 there would be 60% urbanization."

4) Melting glaciers:

Melting glaciers, which is caused by global warming, are the main culprits behind deadly floods around the globe. As per NASA, "Himalayan glaciers are one of the most rapidly depleting glaciers in the world."

Effects of Climate Change

Effects of Climate Change



Adaptation Measures by Pakistan towards Climate change:

(1) Alteration in the Energy Sector:

Using fossil fuels for energy causes the emission of GHGs. Therefore renewable energy i.e. solar, wind, tidal and nuclear energy should be used to meet the energy needs of the country.

As per the World Bank, "Pakistan has the capability of 13000 MW energy produced from solar and wind energy."

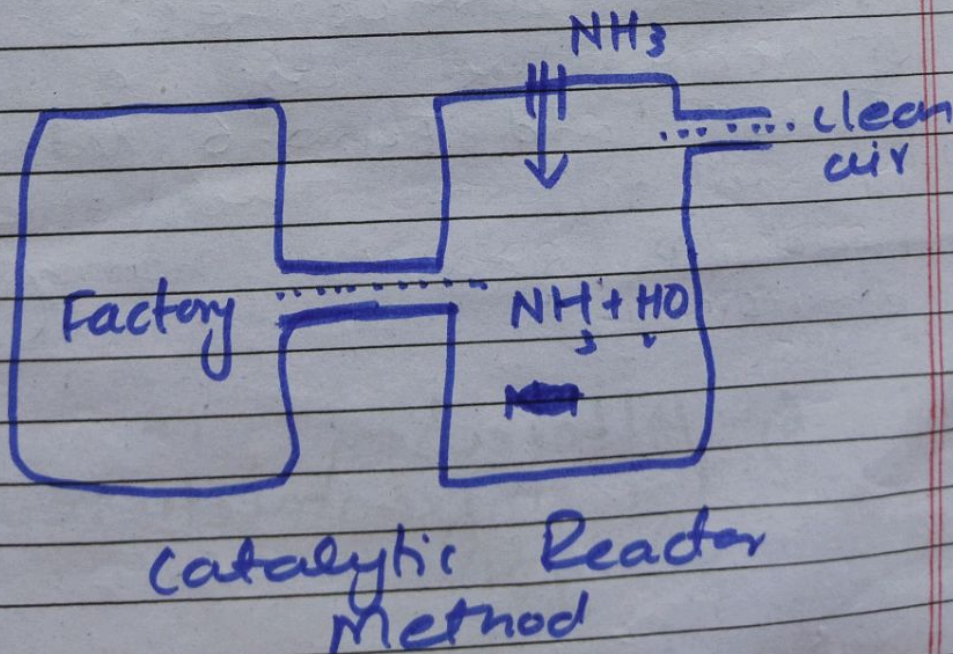
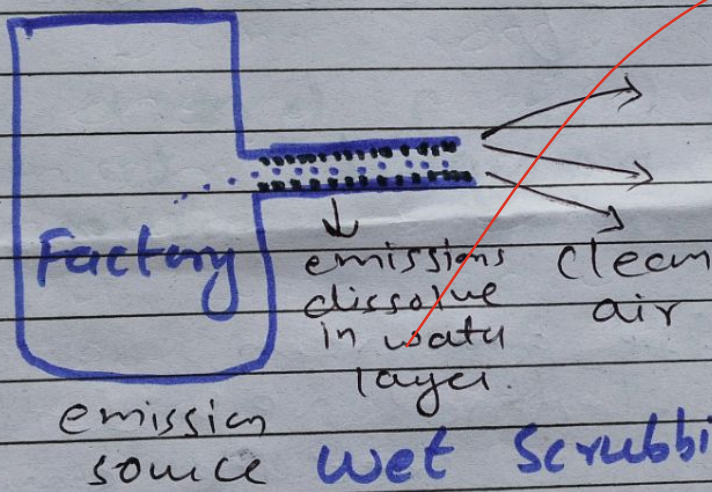
(2) Sustainable Agriculture to ensure food security:

Pakistan should adopt sustainable agricultural practices. These practices include modern irrigation methods like drip and sprinkler method to conserve the loss of water. Moreover, the genetic modified seeds should be used to increase crop yield, crops resistant to pests and drought. This way Pakistan would be able to achieve food security in the wake of climate change.

3, Sustainable Industrialization to reduce emissions and achieve revenue;

Pakistan should adopt to the sustainable industrialization method. Pakistan should integrate technological methods like wet and absorption technique, cyclone method and catalytic reactor

method to reduce industrial emissions. This way way Pakistan would reduce the negative impacts of industrial emissions on the Environment and gain revenue from exports of industrial products.



4) Water Conservation to reduce water scarcity:

Climate change leads to water scarcity. The conservation of water in the form of Dams and public awareness leads to reduce the chances of water scarcity.

5) Use of Green transport to reduce emissions:

Use of green transport like electric vehicles leads to reduce emissions in the atmosphere. Moreover, the use of Euro-5 and Euro-6 catalytic converters in the vehicles lead to reduce harmful emissions.

6) Alteration in the infrastructure design:

Pakistan should

adopt chinese model of sponge city. Sponge city results in the vertical infrastructure, green spaces and water harvesting sites. Moreover, Pakistan should adopt to the climate proof infrastructure design to mitigate the risks of flood on infrastructure.

2) **Green Cover to reduce the level of CO_2 :**

Pakistan should increase the forest cover which absorb CO_2 gas. For instance, Bhutan is the first carbon negative country in the world as it has 60% forest cover.

3) **Circular economy to reduce waste and emission:**

In the circular

economy model, wastes are used as raw material for new products. This reduce environmental emissions and waste generation. For example, European union recycle 60% of its waste for the manufacture of new products.

CONCLUSION:

Pakistan is badly effected by climate change. However, Pakistan should adopt sustainable practices like green energy and sustainable agriculture and industrial production to reduce emissions.

QUESTION: 4

ANSWER:

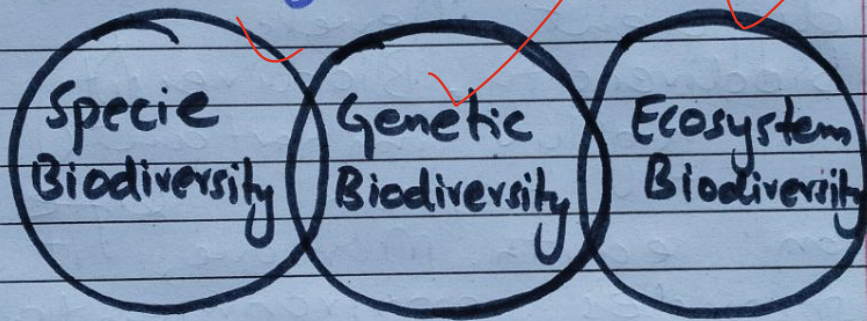
Introduction:

Biodiversity is a variety of different living organisms present on the earth. There are three different levels of biodiversity. Biodiversity is highly important as it sustains life on earth. Moreover, it provides environmental and economic benefits. However, there is loss in the biodiversity due to environmental pollution, habitat loss and environmental crimes. These biodiversity losses can be averted by the habitat restoration, reduction of environmental pollution and strict penalties for environmental crimes.

Biodiversity:

"The totality of plants, animals and microorganisms present on the earth is called biodiversity."

Levels of Biodiversity



1) Species Biodiversity:

Species biodiversity is the different types of species present on the earth.

2) Genetic Biodiversity:

It is the different types of genes in a genetic pool.

3) Ecosystem Biodiversity,

It is the different types of ecosystem present on the earth. These ecosystem include aquatic ecosystem, forest ecosystem and desert ecosystem etc

Importance of Biodiversity:

(1) Sustaining life on the earth:

Biodiversity like plants and animals sustain life on the earth. Plants produce oxygen which is used by humans for breathing.

(2) Source of variety of food:

Biodiversity is the source of food for humans. Plants is

the source of food in the fruits and vegetables. Moreover, animals like fishes and cows are being used in the form of meat.

3) Economic benefits of Biodiversity,

Woods from plants is used as timber and furniture. Moreover, different plants are used in industries. Microorganisms are used to produce biofuel in the industries.

4) Environmental Services of biodiversity:

Biodiversity like plant regulates the temperature of the earth by absorbing CO_2 . It provides shade.

Causes of Biodiversity loss:

1) Climate Change Adversely impact Biodiversity:

Climate change adversely impact the growth and population of biodiversity.

As per IUCN, climate change leads to $\frac{1}{3}$ mammals, $\frac{1}{4}$ birds, $\frac{1}{4}$ conifers lose.

As per European study, "climate change would lead to the extinction of 26% of species of plants and animals".

2) Habitat Loss:

The habitat loss due to over population of humans and the resulting urbanization. This leads to the habitat loss of plants and animals.

3, Urbanization:

Over urbanization leads to the increase demand for food and infrastructure which lead to the destruction of habitat of plants and animals.

4, Deforestation:

Forests maintain the variety of both plants and animal population. Deforestation leads to the loss of biodiversity and their habitats.

5, Invasive species threaten native species:

The introduction of invasive species threaten the native species of plants. This leads to the loss of biodiversity.

(6) Environmental Crimes:

Environmental crimes against plants and animals also lead to decrease in biodiversity. Animals are being hunted to sell its skin. Forest mafia cut down trees for economic gains.

Measures to Reduce the Loss of Biodiversity:

i) Habitat Restoration:

Habitat of plants and animals should be restored to reduce biodiversity loss. Habitat restoration method include insitu method which include botanical gardens. The exsitu method include zoos.

ii) Mitigation of Pollution:

Mitigation of environmental pollution increase the survival chances of biodiversity. Moreover, it reduces the negative impacts of pollution on plants and animals.

iii, Afforestation drives

Increase of forest cover would avert the loss of biodiversity due to deforestation.

iv, Strict penalties for environmental crimes.

Strict penalties for environmental crimes like timber mafia and animal smuggling would reduce the biodiversity loss.

CONCLUSION:

In a nutshell, biodiversity is important

for life on earth. The biodiversity loss due to climate change and habitat loss should be reduced by restoring the natural habitats of plants and animals. Moreover, controlling environmental pollution and crime would reduce biodiversity loss.

QUESTION: 3

ANSWER:

Introduction:

Environmental pollution threaten the life of not only humans but plants and animals. Corrective measures should be adopted to reduce environmental pollution. These measures include use of renewable energy, green transport and reduction of crop burning, by using machines. In addition, the use of modern techniques to reduce industrial emissions. Similarly, the use of biofertilizers to reduce the water pollution caused by synthetic fertilizers. Besides, the use of 3R strategy to reduce waste accumulation and emissions. Furthermore, the use of plantation

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as carbon sink and control of noise pollution. Furthermore, collaboration with neighbouring countries on pollution do not respect boundaries. More awareness of public and investment in R&D should be used to reduce environmental pollution.

Environmental Pollution:

Anything which is added to the atmosphere and has negative impacts on plants, animals and environment is called environmental pollution.

Measures to reduce the Environmental Pollution:

(i) Use of Renewable energy which has low carbon footprints:

Instead of using fossil fuels, Renewable energy like solar, wind, tidal and nuclear energy should be used as it has low carbon footprints and environmental friendly.

As per UNEP, "Utilizing 0.017% of the land of Pakistan could meet its energy demand by solar energy".

(ii) Green transport and the use of modern catalytic converters in vehicles:

Use of green transport like EVs to reduce emissions. Similarly, use of public transport is a good method to reduce emissions. Moreover, use of Euro-5 and Euro-6 catalytic converters

can reduce the emissions from cars.

(iii) Machines to dispose of crop wastes:

Crop wastes should not be burned as it causes emissions and the formation of smog. Happy seeder machines should be used to dispose of crop wastes. Moreover, crop wastes should be used for bioethanol production.

iv Sustainable industrialization to reduce emissions:

Use of wet scrubbing method, catalytic reactor methods to reduce industrial emissions which cause air pollution.

v) Biofertilizers to reduce water pollution:

Biofertilizers like compost should be used to reduce water pollution caused by synthetic fertilizers.

vi) Use of 3R strategy to reduce waste generation and emissions:

Reduction, Reduce, Recycle (3R) strategy should be used to reduce waste generation and emissions from the generation of new production.

vii) Plantation as carbon sinks and noise pollution control strategy:

Increase forest cover from the present 4-5% to reduce increase carbon sequestration. Moreover, plantation around

the roads control noise pollution.

(viii) Cooperation with neighbouring countries.

International cooperation to reduce pollution.

As pollutions do not respect boundaries. As per NASA, crop burning in India causes smog in Pakistan.

(ix) Awareness drive:

Awareness should be spread in public through media. Sustainable choices like public transport, biodegradable plastic could reduce pollution.

(x) Investment in Research and Development

Investment in research and development to find out new ways

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to counter pollution.

CONCLUSION:

Environmental pollution poses threat to Pakistan. These environmental threats can be mitigated by green transport, use of renewable energy and sustainable industrialization and spreading awareness in public.

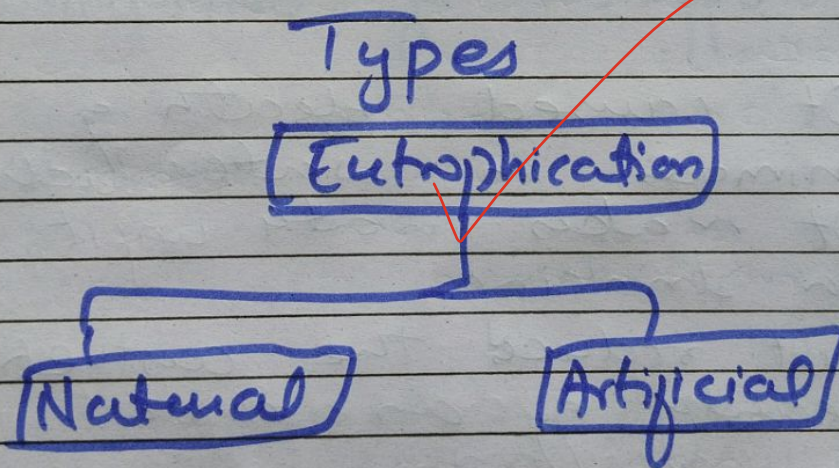
QUESTION: 8

ANSWER

Part "1"

Eutrophication:

Increase in the nutrient content of water which causes water pollution.



1) Natural Eutrophication,

Natural eutrophication takes place on its own and ~~it~~ is a slow process which takes years.

2) Artificial Eutrophication,

Artificial eutrophication is caused by human and is a speedy process.

Causes of Eutrophication:

- 1) Water runoff from Agricultural land
- 2) Harmful chemical emissions from ^{industrial} chemicals.
- 3) Household waste
- 4) Waste from construction work.

Effects of Eutrophication:

- 1) It caused death of animals in water bodies
- 2) It makes water unfit for drinking.
- 3) It reduces the aesthetic beauty of an area.

Controlling Measures:

- 1) Solid waste management to reduce waste.
- 2) Biofertilizers
- 3) Use of filters by industries.

Deforestation:

It is the reduction in the forest cover by human activities.

Causes of deforestation:

- 1) Increase in over population which enhances the demand for agriculture land and buildings.
- 2) Use of forest land for commercial activities.
- 3) Use of forest wood for timber and ~~timber~~ trade.
- 4) Forest fires also lead to deforestation.

Impacts of deforestation:

- 1) deforestation leads to decrease plants which increase global warming.
- 2) Deforestation leads to soil erosion.
- 3) Deforestation leads to severe floods.
- 4) It leads to habitat loss of animals.

Controlling Measures:

1) Legislation to increase forest cover.

The constitution of Bhutan guarantees 60% forest cover.

2) Afforestation and reforestation drive to increase forest cover e.g. 12 billion Tsunami tree project.

Part "3"

National Conservation Strategy 1992:

It was adopted by Pakistan in the Earth Summit in 1992.

This policy was formulated with the help of international NGOs like UNDP. Pakistan took 5 years to adopt it.

Objectives of National Conservation Strategy:

- 1) The objective of NCS is to protect natural resources.
- 2) It is formulated to control pollution.
- 3) The objective of National Conservation Strategy to undergo sustainable development.

Sectors targeted by NCS:

- 1) Livestock
- 2) Agriculture
- 3) Forest
- 4) Industries
- 5) Water
- 6) Forests

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Mid term Review of NCS by Foreign countries:

Success:

- 1) It has increased awareness among public.
- 2) It started consultation among different institutions.

- 3) It increased the capacity of institutions.

Failure:

- 1) It failed to undergo sustainable development.
- 2) It failed to control pollution.

Part "5"

Green Revolution:

It was the agriculture revolution to increase crop production.

Methods adopted to increase crop production:

- 1) Use of technology for cultivation and sowing of plants.
- 2) Use of genetically modified seeds to increase production.
- 3) Use of sophisticated tools for agricultural practices.

(1)