

Read the question carefully and address exactly what is asked, avoiding unnecessary deviation.

Start with a clear and relevant introduction that shows understanding of the topic.

Structure the answer logically: introduction, explanation/analysis, and a brief conclusion.

Use correct scientific terminology (e.g., biodiversity, sustainability, carbon cycle, eutrophication).

Explain concepts clearly and accurately, avoiding vague or generalized statements.

Support answers with relevant examples, preferably from Pakistan or global case studies where appropriate.

Include data, statistics, or facts (e.g., temperature rise, deforestation rates) when relevant to strengthen arguments.

Incorporate environmental laws, agreements, or protocols (e.g., Paris Agreement, Kyoto Protocol, SDGs) where applicable.

Show cause-and-effect relationships in environmental processes.

Focus on analysis and application rather than rote definitions.

Present balanced views by mentioning impacts,

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(2)

II - GLOBAL WARMING AND NATURAL DISASTERS - A THREAT TO HUMANITY

Global warming is associated with natural disasters and by virtue of natural disasters, they pose a real threat to humanity. Floods and famine are most important natural disasters associated with global warming.

(i) - FLOODS AND HUMANITY

Global warming leads to melting of glaciers. The unusual melting of glaciers causes floods. The floods in turn are associated with a great number of casualties posing a risk to humanity.

(ii) GLOBAL WARMING INDUCED DROUGHTS - A THREAT TO HUMANITY

Like wise, global warming results in altered patterns of rainfall. This leads to droughts, which ultimately leads to famine. Thus, in this way, global warming acts as a threat to humanity.

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(3)

GLOBAL WARMING - AND BIODIVERSITY LOSS - A THREAT TO HUMANITY

likewise, Global warming is also associated with loss of biodiversity. Biodiversity loss is associated with various dynamics of humanity. It leads to economic issues to societies at one hand and alters local environmental conditions, posing a risk to humanity.

GLOBAL WARMING INDUCED DEFORESTATION AND ITS IMPACTS ON HUMANITY

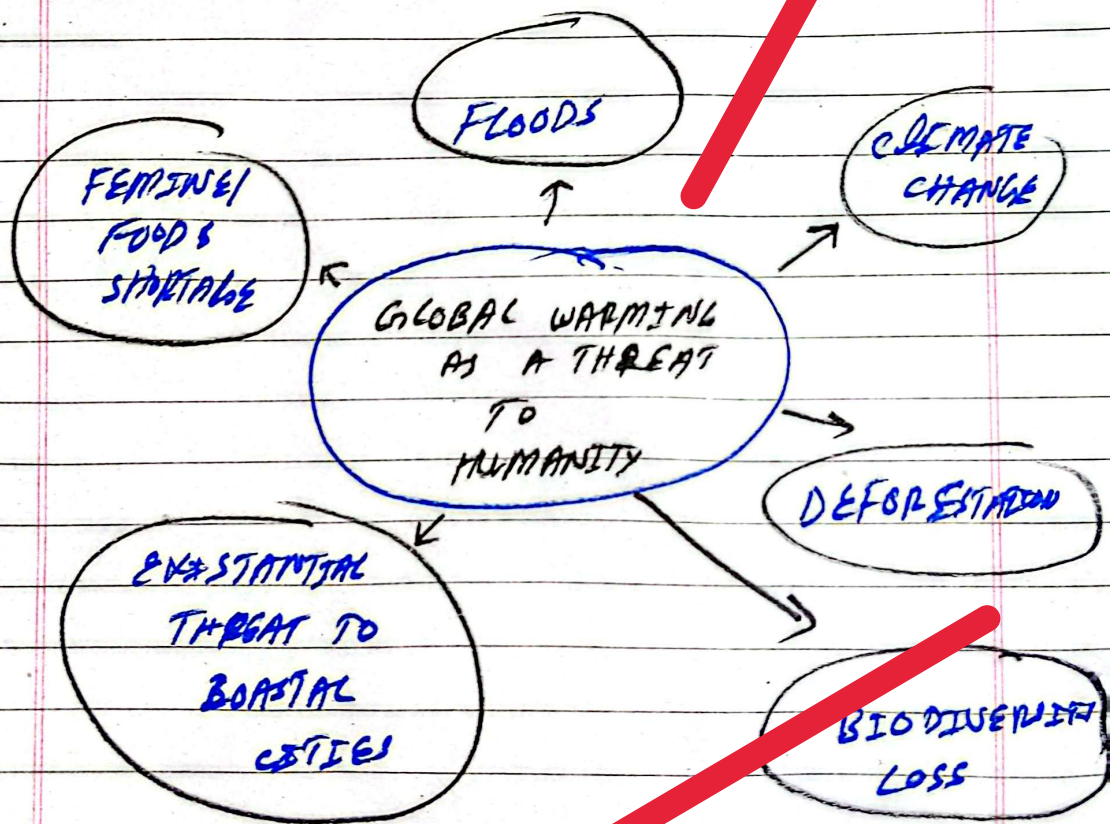
Another important aspect of climate change is its effect on deforestation. As global warming is associated with change in climate. The adaptation to new climate becomes a challenge to various botanical species. This stress lead to competition among species and results in natural selection of fittest. In this way many trees are lost and become extinct. In this way global warming impacts the forest.

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GLOBAL WARMING AND THREAT TO COASTAL CITIES AND ISLANDS

As global warming is associated melting of glaciers due to increased temperatures, it leads to rise in ~~glaciers~~ sea level. Rise in sea level is directly associated with an ~~existential~~ threat to coastal cities and islands, which can become ~~inhabitable~~ due to rise in sea level.



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③

PART B

BIODIVERSITY

Biodiversity refers to the presence of various life forms on the planet Earth.

BIODIVERSITY LOSS

Biodiversity loss refers to extinction and disappearance of Fauna and Flora in a given ecosystem. It refers to loss of life forms as a consequence of environmental changes.

CAUSES OF BIODIVERSITY LOSS

A number of anthropogenic factors are responsible for biodiversity ~~loss~~ loss.

1) UNCONTROLLED HUNTING

Hunting of endangered species is a major cause of biodiversity loss. Though there are legislations at national and international

ii- CLIMATE CHANGE AND BIODIVERSITY LOSS

Climate change is another factor which leads to biodiversity loss. The Flora and Fauna become unable to adapt to climate change and hence become extinct leading to biodiversity loss.

iii- DEFORESTATION, LOSS OF HABITAT AND BIODIVERSITY LOSS

Similarly, to fulfill the domestic needs, forests are cut. This leads to loss of habitat and ~~flora~~ fauna disappears eventually.

IV- POPULATION GROWTH AND BIODIVERSITY LOSS

Population growth is another important factor which leads to biodiversity loss as

a- For more population, more food is needed, which leads to cutting of trees for agricultural purpose and loss of habitat for biodiversity.

b- Over population leads to more industrialization, for which more raw materials are required. These raw

materials are obtained from trees by cutting the trees. This leads to biodiversity loss due to habitat loss.

V- FOREST FIRES AND BIODIVERSITY LOSS

Forest fires are another major cause of biodiversity loss in which many species become extinct.

VI- PREVAILING MYTHOLOGIES AND BIODIVERSITY LOSS

Another important cause of biodiversity loss is myths related to various organisms regarding their potency in treating malaria and other such diseases. This leads to uncontrolled hunting of organisms.

VII- MEDICINAL USE OF ORGANISMS AND BIODIVERSITY LOSS

Excessive dependence of pharmaceutical industry on flora and fauna is another cause of biodiversity loss.

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IX- AIR POLLUTION AND BIODIVERSITY LOSS

Air pollution leads to various air borne diseases leading to extinction of species.

X- WATER POLLUTION AND BIODIVERSITY LOSS

Water from industries contains heavy metals like Mercury, cadmium and nickel. These metals, when consumed by organisms lead to chronic and acute diseases leading to their death and ultimate extinction.

XI- ARMS AND NUCLEAR RACE AND BIODIVERSITY LOSS

Atom race and nuclear race leads to devastation of environment and hence loss of habitats. This leads to climate change habitat loss and ultimately leads to biodiversity loss.

IMPACTS OF BIODIVERSITY LOSS

i- ECONOMIC IMPACTS

Biodiversity is the backbone of economy. It plays important role in economy of a country by providing raw materials and tourism industry to a country. Loss of biodiversity leads to loss of economic prosperity.

ii- ENVIRONMENTAL IMPACTS

Through loss of biodiversity, food chains and food webs of an ecosystem are disturbed and hence ecosystem becomes unable to sustain. Furthermore, environmental pollution specifically land pollution is caused due to loss of scavengers.

iii AESTHETIC IMPACTS

Biodiversity beauty of environment. It gives aesthetic beauty to the environment. Loss of biodiversity leads to loss of aesthetic characteristics of environment.

1) WAY6 FORWARD

a- IMPLEMENTING THE LAWS

Implementing laws related to biodiversity in true letter and spirit can lead to its preservation.

b- population Control

Similarly, population control is another way to manage biodiversity loss.

c- MANAGING POLLUTION

pollution control is another important way to deal with pollution.

d- RESTORING HABITAT

Restoration of habitat by reforestation and afforestation can be done to manage biodiversity loss.

e- PRESERVING ENDANGERED SPECIES

Similarly, preservation of endangered species through national parks can be a practical step to manage biodiversity loss.

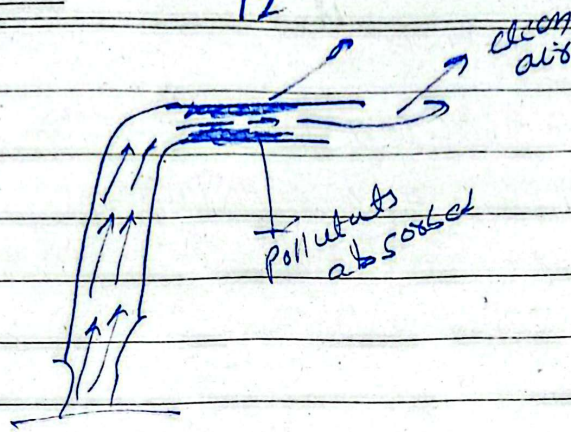
TECHNOLOGICAL OPTIONS TO COUNTER AIR POLLUTION

INTRODUCTION

Air pollution is one of major environmental hazard associated with many environmental issues. Therefore efficient methods to counter air pollution are required. Various methods including chemical and physical methods are used to reduce the air pollution. Wet absorption, Adsorption, and catalytic converters are few important technological options available to counter the air pollution.

(i) WET ABSORPTION METHOD

One major technology is wet absorption technology. In this method air are absorbed through their contact with a wet surface. The wet surface has the ability to absorb the pollutants in efficient way and clean air is released to the environment. The gases are filtered before they are released to environment.



(ii) ADSORPTION METHOD

It is another way in which pollutants are adsorbed over a surface. The pollutants can be efficiently adsorbed and then removed. The interaction between adsorbent and adsorbate is used to separate pollutants from air.

(a) **Adsorbate:** pollutants in air which are attached to surface.

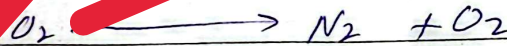
(b) **Adsorbent:** The surface over which pollutants attach is adsorbent.

iii- USE OF AIR SCRUBBERS

Use of air scrubbers are another way in which air pollutants are used to collect the pollutants and clean the air. This is one of the the efficient way to clean the environment.

IV- CATALYTIC CONVERTERS

Another important technology to reduce air pollution is use of catalytic converters. The chemicals/catalysts in converters convert the poisonous gases to harmless gases. Catalytic converters are mostly used in automobile/vehicles. The dangerous nitrogen oxides are converted to Nitrogen gas which is part of atmosphere and harmless.



PART B

WAYS TO ADAPT CLIMATE CHANGE

Pakistan is among the most vulnerable 20 countries (U-20) most susceptible to climate change. Practical measures are required to adapt to climate change.

(1) REFORESTATION DRIVES LIKE BILLION TREE PROJECT

One major step that can be taken is the Reforestation and afforestation drives.

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Like Billion tree projects.

ii) CARBON TAX

Another way is to implement carbon tax proportioned to the consumption of fossil fuels and to use carbon tax for reversing climate change.

iii- SHIFTING TO CLEAN ENERGY

Another way is to shift to clean energy resources like solar and wind. The subsidies on clean energy projects can be given for reversing climate change.

iv- AWARENESS CAMPAIGNS

Awareness in general public is another important way to cope with climate change.

iv- ADVOCATING CLIMATE MITIGATION MEASURES AT INTERNATIONAL LEVEL

Similarly, curbing greenhouse gas exploitation of ~~poor~~ developed countries can be another policy option with ~~reason~~.

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CHALLENGES

1- ROLE OF DEVELOPING COUNTRIES

The burning of fossil fuel in developing countries is a major challenge as it is beyond the scope of Pakistan.

2- RELUCTANCE OF GLOBAL NORTH

Global North is reluctant to accept and agree to concept of net carbon zero. The Trump withdrawal of Paris climate agreement is one such development showing West's resist.

iii. NORTH SOUTH DIVIDE

Similarly, the huge gap between North and South is another reason for climate issue as developing state of South wants to equate the developed states of North.

iv - ECONOMY AS NEW WAR FRONT AND CLIMATE CHANGE

Similarly, emergence of economy as a new war front and its link with

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Industrialization is another challenge.

V- POPULATION GROWTH IN PAKISTAN AND CLIMATE CHANGE

Similarly growing population in Pakistan is another issue for managing climate change in Pakistan.

VI- IMF DEPENDENCY AS AN ULTIMATE CHALLENGE TO PAKISTAN

Pakistan's dependency on IMF also impedes its ability to cope with climate change in Pakistan.

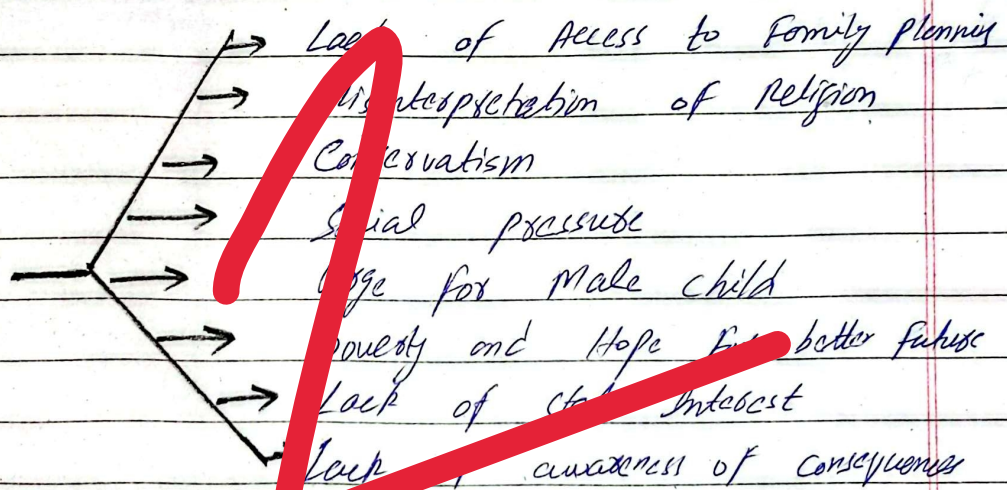
QUESTION NO 06

PART A

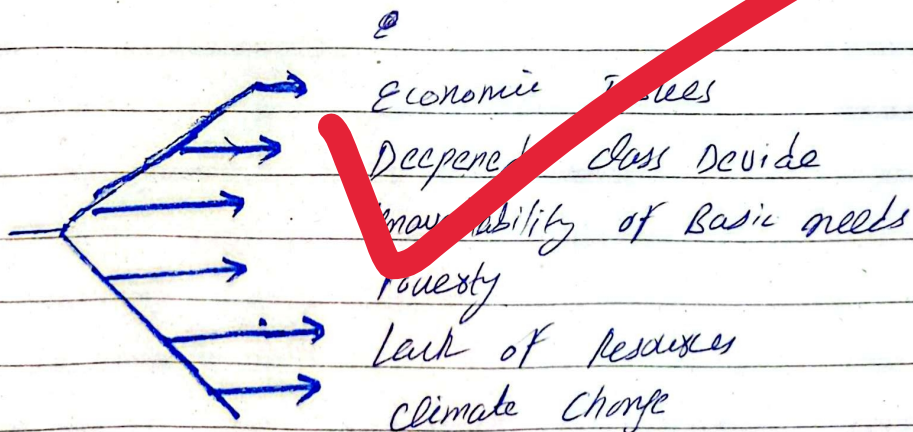
POPULATION EXPLOSION

Population explosion refers to rapid increase in population. It is due to more birth ratio than the death ratio.

CAUSES OF OVER POPULATION



IMPACTS OF OVER POPULATION



PART B

FOOD INSECURITY

Food insecurity
a term referred to scarcity
or unavailability of food due to
a number of reasons

CAUSES

- Climate Change
- Global Warming
- Biodiversity Loss
- Floods
- Wars
- Droughts
- Poverty
- Lack of Resources
- Natural Disasters
- Over population
- Pest attacks
- Scarcity of rain fall
- Land exploitation

PART C

SALINITY AND WATER LOGGING

Salinity refers to presence of salts in the soil and water logging refers to excessive moisture content in the soil.

CAUSES

- Over exploitation of land for Agriculture purpose
- Use of synthetic fertilizers in excessive amount

IMPACTS:

- Loss of yield
- Droughts
- Unfit for irrigation

WAY FORWARD

Using Natural Fertilizers instead of synthetic fertilizers
Doing agricultural activities at alternation days.

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PART 2

ENERGY SECURITY

It refers to security the energy for future time periods

CHALLENGES TO ENERGY SECURITY

- population growth
- limited supply of fossil fuel
- wars like Ukraine Russia war
- Energy politics

WAY FORWARD

- Energy conservation
- Shifting towards green and sustainable energy resources
- Policy changes to conserve energy issue

QUESTION NO 02

DRIVERS OF CLIMATE CHANGE

I- USE OF FOSSIL FUEL

Fossil fuel like natural gas, coal and petroleum are major drivers of climate change

ii- RAPID INDUSTRIALIZATION

industrialization leads to more production of hazardous gases and this leads to climate change

iii- USE OF AUTOMOBILES

Excessive use of automobiles is another driver of climate change

iv. OVER POPULATION

Increasing population is another major driver of climate change

v- DEFORESTATION

Deforestation is another important driver of climate change.

PROCESS OF CLIMATE CHANGE

The fossil fuels and exhausts from industries leads to production of gases. Similarly, cutting of trees and overpopulation leads to increase in carbon dioxide and other green house gases. This increase leads to trap of solar radiations. Solar radiations fall on earth surface during day time, when at night, these radiation tries to escape earth surface, but these radiations are trapped by gases ~~like~~ like carbon dioxide, causing ^{temperature of} earth surface to rise. This leads to increase the temperature of earth, hence it leads to global warming. The global warming leads to climate change.

