

QUESTION # 04.

GLOBAL BOILING

1. INTRODUCTION:

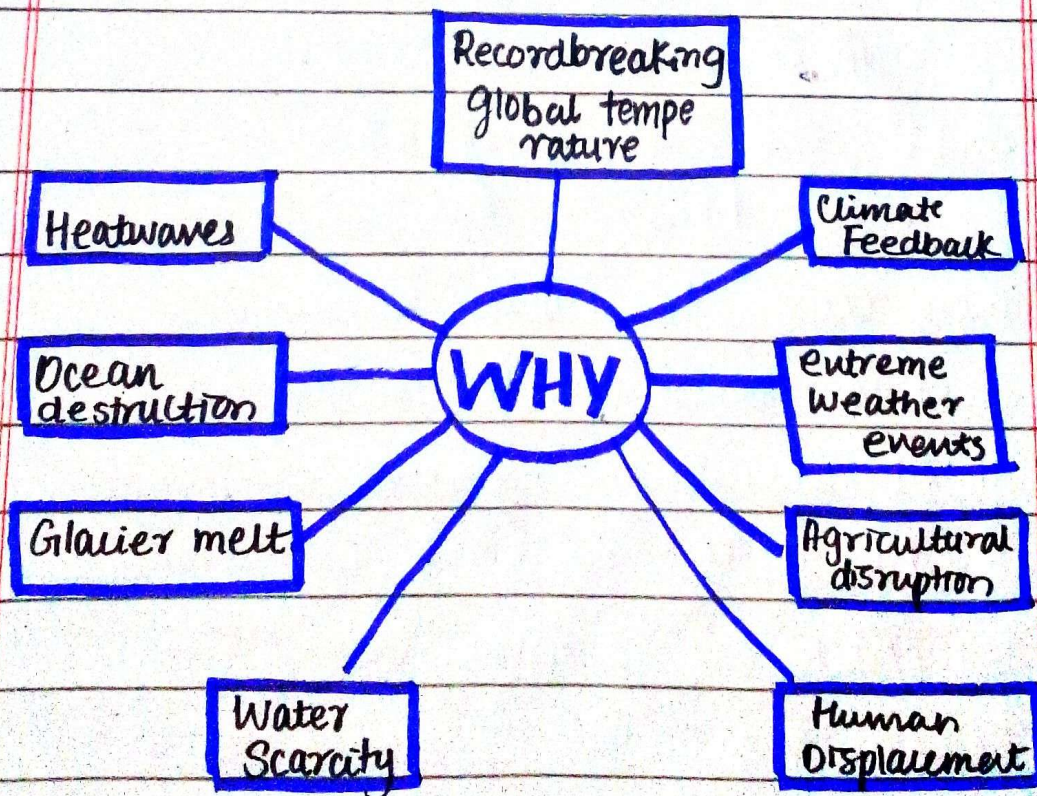
"Era of global warming has ended, now it is the era of global warming."

~Antonio Guterres

The world is witnessing rapid rise in temperature—leading to global warming. It is no doubt that human activities are the cause behind this, but now these causes have even worsen the existing condition. It is not a global warming anymore, but global boiling. Record-breaking global temperatures, intensification of heatwaves, and rapid glacier melts show how the pace has

Shifted. Similarly, climate feedback loops are accelerating warming and heat waves collapsed marine ecosystems. These along with other points are discussed below which will justify the fact that era of global warming has ended, but global boiling started.

2. ERA OF GLOBAL WARMING HAS ENDED, AND GLOBAL BOILING STARTED



2.1. Recordbreaking global temperatures show the intensification of global warming

The average global temperature has increased about more than 1.5°C than industrial revolution times. Moreover, it is expected to reach 2.0°C more than of 1850s which show that it is leading to global boiling, as earth has already warmed much.

2.2. Intensification of heatwaves in climate vulnerable countries.

Many climate vulnerable countries like Pakistan and of sub-Saharan region are witnessing a surge in heatwaves due to increasing

temperature. For example, more than 1200 people died in Karachi in last 10 years due to heatwaves.

2.3. Rapid glacier melt due to increasing temperature

Another fact that proves the fact that it is the era of global boiling is rapid glacier melt. Increasing temperature is increasing glacier melting in Antarctic and Greenland. Moreover, Pakistani glaciers are melting too, leading to floods etc.

2.4. Climate Feedback loops accelerating warming

Glacier melting is decreasing earth's albedo, permafrost releases methane and this leads to forest shift from Carbon

Sinker to Carbon Sources — Supporting the fact that world is living in the era of global boiling.

2.5. Escalation of extreme weather events

Due to increase in temperature at a rapid rate, heatwaves, floods, Tsunamis, and wildfire occur rapidly. For example, floods in Pakistan, droughts in some African countries, and 2024's wildfire in California are due to global boiling.

2.6. Ocean Heatwaves and Marine Ecosystem Collapse

Oceans absorb heat leading to increase in temperature of Ocean surface and heatwaves. These heatwaves affect the

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aquatic life and disrupts marine ecosystem. This proves the fact that now its the time of boiling, not warming.

2.7. Agricultural Disruption and Food insecurity

Increasing temperature is also effecting the agriculture. The changing rainfall patterns or the extreme weather events disrupt crop growth, leading to food insecurity.

2.8. Water Scarcity and Hydrological Instability

Increasing temperature disrupts the water cycle. Increasing precipitation and evaporation occurs at some places leading to heavy rainfalls and floods.

Resultantly, it disturbs the natural river system.

2.9. Climate Induced Human Displacement

Due to increase in temperature, people are migrating because global boiling is occurring, disrupting the normal lifestyle. For example, Indonesia has shifted its capital because the previous one was a coastal city and, soon, if the situation does not change or controlled, rising sea level will effect.

3. CONCLUSION:

The era of global boiling has started, as it has now started directly threat to life by disrupting the normal lifestyles.

QUESTION # 06

PART. A

SOLID WASTE MANAGEMENT

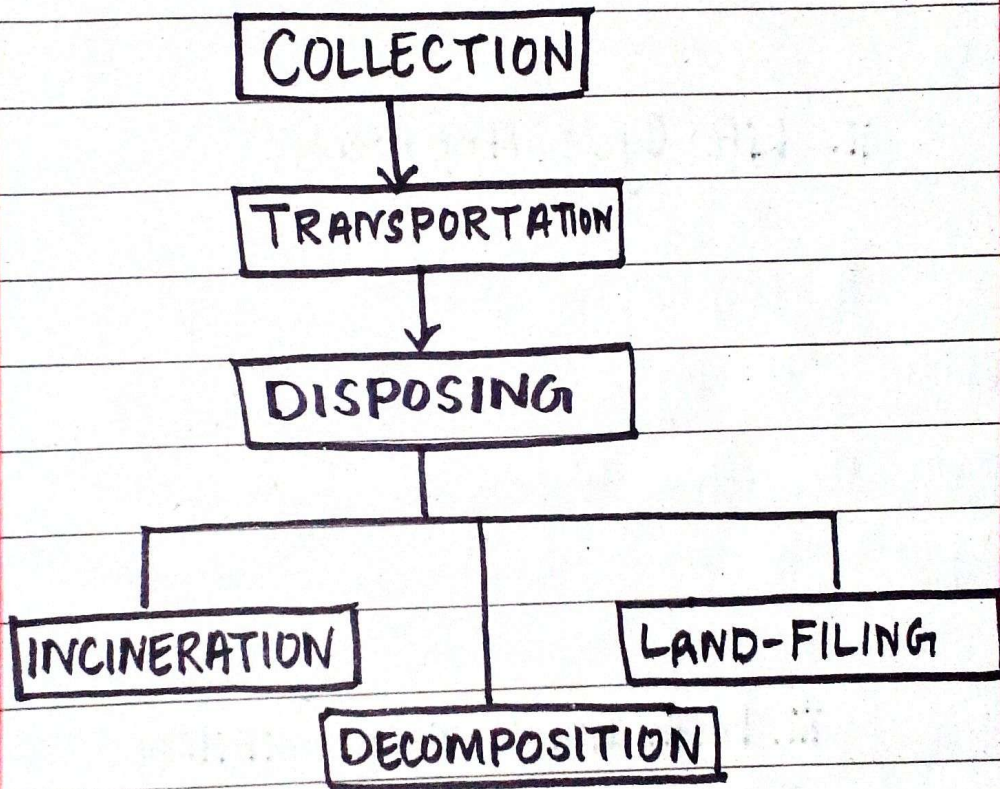
1. INTRODUCTION:

Solid Waste Management refers to the systematic process of collecting, transporting, processing, recycling, or disposing of solid waste in a way that protects human health and the environment -

To effectively manage, Pakistan has devised National Solid Waste Management Policy in 2022, which has laid the framework for dealing with Solid Waste Management. It includes policy framework, lifecycle approach, institutional responsibilities, and segregation, handling e.t.c

2. CONCEPT OF SOLID WASTE MANAGEMENT

Solid Waste management usually deals with the solid waste like garbage, hazardous, and E-Waste. It has three steps.



3. SALIENT FEATURES OF NATIONAL SOLID WASTE MANAGEMENT POLICY 2022

Following are the salient features of NSWM 2022.

i. Policy Framework and Rationale

This policy formulated to address the rising waste generation in Pakistan and align with international treaties like Basel Convention.

ii. Life Cycle Approach

It emphasizes managing waste throughout its life cycle - from its generation to final deposit.

iii. Institutional responsibility and Coordination

This policy clarifies rules, roles, and responsibilities of federal and provincial agencies, local governments, waste generators, and stakeholders.

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iv. Segregation, Handling, and Transport Standards

It emphasize on Segregation, handling, Transports and Storage Standards. Hazardous Solid Waste should be segregated from non-Hazardous.

v. Capacity building, awareness, and research

Human resource development, training of officials and public awareness campaigns are emphasized for efficient management.

4. CONCLUSION:

Solid Waste is an important issue and requires efficient Solid Waste management. For this purpose, Pakistan has devised National Solid Waste Management Policy which addresses these issues.

(PART-B)

BIODIVERSITY

1. INTRODUCTION:

Biodiversity refers to the variety of life on Earth, encompassing genetic diversity within species, species diversity among organisms, and ecosystem diversity across terrestrial, freshwater and marine environments. It represents biological wealth that sustains ecological balance and human survival. However, due to some human-made causes, it is decreasing having effects on human life.

2. CAUSES OF BIODIVERSITY LOSS

Following are the causes of biodiversity loss.

i. Habitat Destruction

Human activities like deforestation, urbanization, and industrialization has destroyed the natural habitat forcing them to migrate.

ii. Climate Change

Rising temperature, altered rainfall patterns, and extreme weather events disturb the breeding life cycles and ecosystem stability.

iii. Overexploitation

Humans are overexploiting natural resources. Unsustainable hunting, overfishing leads to decrease in the number of these species.

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3. EFFECTS OF BIODIVERSITY LOSS

i. Food insecurity

Decline in pollinators, soil organisms, and marine species threatens agricultural productivity.

ii. Economic Losses

Due to loss in biological resources, sectors like tourism, fisheries, and pharmaceuticals suffer

iii. Ecosystem instability

Due to biodiversity loss, ecosystem becomes more vulnerable to shocks such as droughts and floods

4. VALUE OF BIODIVERSITY

i. Ecological Balance

Biodiversity maintains

ecosystem balance, nutrient cycling, energy flow, and resilience against environmental shocks

ii. Economic Benefits

It provides raw materials, food, medicines, timber, especially for rural communities

5. CONCLUSION:

Biodiversity is the foundation of life-support system on earth. However, due to human causes it is rapidly declining and affecting both human and environment. Conservation of biodiversity is necessary.



QUESTION # 08

(PART-A)

AGENDA-21

1. INTRODUCTION:

Agenda 21 is a comprehensive action plan adopted at the ~~UNE~~ UN Conference on Environment and Development. The 21 signifies 21st century, emphasizing sustainable development goals. It focuses on integrating environmental protection, social equity, and economic development at global, national, and local levels.

2. OBJECTIVES OF AGENDA 21:

Following were the objectives of Agenda 21.

1. 1202 Day:
i) Promote sustainable development worldwide -

ii) Integrate environmental considerations into development planning -

iii) Strengthen national and local capacities for environmental management.

iv) Encourage public participation and community involvement in sustainability initiatives.

3. STRUCTURE OF AGENDA 21:

It consisted of 40 chapters, divided into four main sections:

i) Social and Economic Dimensions

→ Combats poverty, illiteracy, and health issues.

→ Promotes sustainable population and settlement policies.

ii) Conservation and Management of Resources

→ Promotes atmosphere protection -

- Sustainable land use and deforestation control.
- Biodiversity conservation.

iii) Strengthening the role of major Groups

- Encourages women, children, indigenous people, and workers to participate in Sustainable development.
- Promotes capacity building, education, and awareness.

iv) Means of implementation

- International cooperation and partnerships.

- Technology transfer to developing countries

4. SALIENT FEATURES:

i) Comprehensive Scope

Covers: environment, economy, and social development.

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ii) Participatory Approach

Involves governments, civil society, NGOs and local communities.

iii) Non-binding nature

Focuses on guidance and recommendations, not enforcement.

iv) Emphasis on equity

Recognizes needs of developing countries and vulnerable populations

5. CONCLUSION:

Agenda 21 is a blueprint for sustainable development in the 21st century.

It integrates environmental, social, and economic dimensions.

PART-B

EUTROPHICATION

INTRODUCTION:

Eutrophication is nutrient enrichment of water bodies leading to excessive algal growth, oxygen depletion, and ecological collapse. It is basically a kind of slow poisoning of ecosystem. There are multiple causes behind eutrophication, and it affects aquatic and human life. However, it can be cured through practical solutions.

2. TYPES OF EUTROPHICATION

There are two main types of eutrophication.

EUTROPHICATION

Natural Eutrophication

It is a natural geological time-scale process. Lake collects nutrients gradually. It takes centuries.

Cultural Eutrophication

It is due to anthropogenic causes. Fertilizers, sewage, detergent contribute to it.

3. CAUSES OF EUTROPHICATION:

i) Agricultural runoff:

Excessive use of fertilizers in farms leach out due to rain. These fertilizers have Nitrogen and Phosphorous, a source for algal growth.

ii) Untreated Sewage Discharge

Municipal wastewater flows

to freshwater without proper treatment. These provide nutrients for algal growth.

iii) Industrial effluents

Industrial processes like food processing, textile, paper industries produce nutrient rich waste — helping in algal growth

4. EFFECTS OF ALGAL GROWTH — EUTROPHICATION

i) Toxic Algal Bloom

Formation of algal bloom in water — making it appear green or blue-green. Some algae are toxic e.g. Cyanobacteria.

ii) Oxygen Depletion (Hypoxia)

When algae dies, the bacteria start decomposition. This leads to reduction in

dissolved O_2 - leading to death of fishes.

iii) Drinking Water Contamination

Algal toxins are dangerous for humans, as they cause skin diseases and liver damage

5. SOLUTIONS:

i) Nutrient Source Control:

Regulation of fertilizers and adoption of precision agriculture.

ii) Wastewater Treatment Plants:

Sewage water must be properly treated in order to remove Nitrogen and Phosphorus

6. CONCLUSION:

Eutrophication is an environmental chain reaction which hits food security, public health, and aquatic life. It requires proper solutions for management