

GSA - 2017.

Q1:-

1a:

Q:- What are the factors responsible for environmental pollution?

Answer:-

Environmental pollution is the most important and complex issue of the contemporary and early centuries. It is increasing at a pace faster than ever. Human Activities being the primary driver of pollution, enlisted below are some key factors contributing to environmental pollution:-

I. POPULATION:-

The drastic rise in population has led to increased anthropogenic activities by manifold. These add unwanted substances to atmosphere, henceforth leading to pollution.

ii URBANIZATION:-

Recent rapid urbanization has led to

(a) ↑ construction activities.

(b) increased waste generation.

The above mentioned key factors of urbanization add significant amount of undesirable products to environment.

iii INDUSTRIALIZATION:-

(a) Industrial emission.

Factories and industries emit large quantities of pollutants including green house gases (CO_2 , methane), SO_2 , nitrogen oxides and VOCs into air.

(b) Waste:- industrial waste is released into water and soil relating to pollution.

iv AGRICULTURE:-

Water pollution is a result of the use of chemical pesticides and herbicides in agriculture.

Also leading to eutrophication.

Urbanization:-

v DEFORESTRATION:-

Land deforestation leads to soil erosion, loss of normal healthy ecosystem and contributes to land pollution.

Removal of trees lead to increase in CO_2 level in atmosphere as trees act as CO_2 sinks.

vi HOUSEHOLD ACTIVITIES:-

Routine household products including cleaners, chemicals, paints etc contribute largely to air, soil and water pollution. Improper water disposal, including improper plastic disposal can affect the natural soil component adversely.

vii ENERGY PRODUCTION:-

Burning of fossil fuels release large quantity of CO_2 , SO_2 & NO_x & other pollutants.

Nuclear enrichment and mining poses a risk of radioactive waste can lead to water & soil pollution.

vii. WASTE MANAGEMENT:-

Poorly managed landfills and leachate of waste lead to release of harmful products in soil, groundwater and air respectively.

viii. NATURAL FACTORS:-

Volcanic eruptions and wildfires release gas like sulphur dioxide, ash, smoke & particulate matter affecting air quality.

ix. TRANSPORTATION:-

On road vehicle emission contribute significantly to deteriorating air quality by releasing pollutants such as CO_2 , CO, NO_x . Mainly & Air transport burn fossil fuel, releasing large amount of NO_x pollutant & green house gases in atmosphere.

x. ————— x ————— x

1b:-

(05)

Question:- Briefly Explain the main reasons of water logging in Pakistan.

Answer:-

WATER LOGGING:-

Water logging is excess water in the root zone of soil accompanied by anaerobic conditions leading to oxygen deficiency.

CAUSES OF WATER LOGGING IN PAKISTAN:-

1. Inefficient Irrigation Practices.

Traditional flood irrigation techniques and lack of proper drainage system result in water accumulation & increased groundwater table and accumulation in the root zone & surface of crops.

2. CANAL IRRIGATION SYSTEM:-

Unlined canal allow seepage into soil raising water table. Flood. Over irrigation using canal water is also another factor.

3. Monsoon Rains:-

Intense and prolonged rainfall along with inadequate

system of management contribute to water logging

4:- SALINITY ISSUES:-

Saline soil, found in many parts of Pakistan, reduce infiltration rate & exacerbates waterlogging.

5. POOR DRAINAGE INFRASTRUCTURE:-

Lack of maintenance of existing drainage system leads to blockage & inefficient water elimination leading to exacerbated waterlogging

(6) AGRICULTURAL PRACTICES:-

Water intensive crops along with Monoculture practices deplete soil structure ultimately leading to water logging.

(7) GROUNDWATER MISMANAGEMENT:-

Over irrigation and poor management raises groundwater table exacerbating waterlogging

(8) URBANIZATION AND INFRASTRUCTURE

Poor urban structural planning with unplanned drainage system alongside encroachment over

water drainage channel disrupt normal water flow.

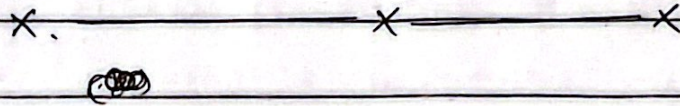
This ultimately leads to urban waterlogging, especially during rains.

(8) CLIMATE CHANGE :-

Altered precipitation pattern and increased evaporation coupled with inadequate drainage ultimately cause waterlogging.

(9) TOPOGRAPHY AND SOIL TEXTURE :-

Most of Pakistan's agricultural land is flat which causes water stagnation. Soil texture, on other hand, have low permeability due to clayey & silty soil.



Q3c

Question:-

What is ozone depletion? How can we prevent its depletion?

Answer:- OZONE:- Ozone is a region of earth's atmosphere containing high concentration of ozone which protects life on earth by preventing harmful effects of Sun's UV rays.

OZONE LAYER DEPLETION:-

Ozone depletion is the gradual thinning of earth's ozone layer in upper atmosphere due to ~~gradual~~ release of chemical compounds containing gaseous bromine or chlorine released from industries or other human activities.

One chlorine atom can destroy 100,000 molecules of ozone. It is destroyed rapidly than recreated.

How To PREVENT OZONE DEPLETION:-

(1) AVOID USING OZONE DEPLETING SUBSTANCES

(a) CFCs

(b) Halons

(c) CCl_4

(d) Methylchloroform (e) HFCs

(2) MINIMIZE USE OF VEHICLES:-

Prioritizing walking, cycling & public transport to limit release of vehicle emitted green house gases.

(3) ECO FRIENDLY CLEANING PRODUCTS:-

Cleaning products contain chlorine and bromine which interact with ozone. These should be substituted with natural products.

(4) PROHIBIT NITROUS OXIDE :-

National and International laws to prohibit usage of nitrous oxide should be implemented to make environment better. This is apparent by Montreal protocol ozone depletion agreement.

Question 1d:-

Question:-

What is an Acid Rain and How it is produced? Briefly describe dangers associated with it.

Answer:-

Acid Rain:-

Acid rain refers to precipitation that contains higher than normal levels of nitric and sulfuric acid. It is made up of acidic water droplets due to disproportionate nitrogen and sulfur emissions by vehicles and manufacturing processes.

How Is Acid Rain Produced?

(1) INDUSTRIAL EMISSIONS:-

(a) Sulphur Dioxide Production-

↳ Burning of coal, fossil fuels, oil.

(a) NO_2

↳ vehicle exhaust, industrial process

combustion of fuels.

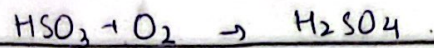
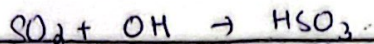
(2) NATURAL SOURCES,

↳ Volcanoes.

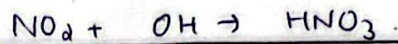
↳ lightning

CHEMICAL REACTION LEADING TO ACID RAIN:-

(1) Formation of sulphuric Acid :-



(2) Formation of Nitric ^{Acid} ~~oxide~~ :-



DANGERS ASSOCIATED WITH ACID RAIN:-

- (a) Deprive plants and soil of essential nutrients
- (b) Health, respiratory and skin issues majorly, in animals and human.
- (c) Corrosion of infrastructure eg:- water pipes. it results in leaching of heavy metals and ultimately poor water quality.
- (d) Threat to aquatic life. by altering chemical composition of water, disrupting aquatic ecosystem.
- (e) Stone & metal building and monuments are destroyed.