

## ASSIGNMENT - 1

Name :- Sahil Kaundal

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Q1. Air pollution is a major threat to human health. Urban air quality in most megacities has been found to be critical and Kolkata Metropolitan City is no exception to this. Discuss the air pollution and human health implications in Kolkata, India.

Ans:- Air pollution poses a significant threat to human health in Kolkata Metropolitan City, India, similar to many other megacities around the world. The urban air quality in Kolkata has been found to be critical due to various sources of pollution, primarily stemming from vehicular emissions, industrial activities, construction, and biomass burning.

1. Respiratory Problem :- High levels of air pollutants, such as particulate matter and nitrogen dioxide, can lead to respiratory issues like asthma, bronchitis, and other chronic obstructive pulmonary disease.
2. Cardiovascular Diseases :- Long-term exposure to air pollution has been linked to an increased risk of cardiovascular diseases, including heart attacks, strokes, and hypertension.
3. Child Health :- Children are particularly susceptible to the negative effects of air pollution.
4. Quality of Life :- Poor air quality can significantly affect the overall quality of life for residents of Kolkata.
5. Economic Impact :- The health implications of air pollution place a burden on the healthcare system and the economy.

Q2. Delhi Air Quality Index generally hovers from moderate to worse.  
It is rarely satisfactory and never 'good'. Discuss in detail the Delhi air pollution: its sources, effects and preventive measures.

Ans. Sources :-

1. Vehicular Emissions:- High vehicular density, especially diesel vehicles, contributes significantly to air pollution.
2. Industrial Activities:- Industries emit pollutants like particulate matter, sulfur dioxide, and nitrogen oxides.
3. Waste Burning:- Open burning of waste releases harmful pollutants into the air.
4. Construction and Dust:- Uncontrolled construction and road dust generate fine particulate matter.

Effects :-

1. Respiratory Issues:- Worsened air quality causes respiratory illnesses like asthma and bronchitis.
2. Cardiovascular Diseases:- Pollutants elevate the risk of heart diseases and strokes.
3. Economic Impact:- Healthcare costs and productivity losses rise.

Preventive Measures :-

1. Waste Management:- Implement efficient waste disposal methods and discourage open burning.
2. Behaviour Changes:- Encourage carpooling, use of bicycles and reduced use of fossil fuels.
3. Emergency Actions:- Develop contingency plans for severe pollution episodes.
4. Green Initiatives:- Increase green cover and promote urban green spaces.

Q3. Pollution of the Ganges, the largest river in India, poses significant threats to human health and the larger environment. Discuss the Ganga pollution case study taking into account the reasons behind the pollution. Also, discuss some of the schemes of the government to purify the river and critically analyze its impacts. Further, suggest the changes that should be done to make an effective implementation.

Ans:- Reasons :-

1. Industrial Effluents :- Discharge of untreated industrial waste into the Ganga containing toxic chemicals and heavy metals.
2. Sewage Discharge :- Massive volumes of untreated sewage from cities along the river, containing pathogens and nutrients.
3. Religious Practices :- Dumping of religious offerings and human remains into the rivers.
4. Deforestation :- Reduced tree cover leads to soil erosion and increased sediment load in the river.

Government Schemes :-

1. Construction of Sewage Treatment Plants :- To treat domestic sewage before discharge into the river.
2. Biodiversity Conservation :- Initiatives to restore aquatic life and biodiversity of the river.
3. Industrial Effluent Treatment :- Stricter regulations and penalties for industries discharging pollutants.

Critical Analysis :-

1. Mixed Progress
2. Slow Implementation.
3. Lack of Monitoring.

Suggestions.

1. Holistic Approach
2. Transparency
3. Sustainable Agriculture.
4. Behavioral Change
5. Interstate Coordination
6. Technology and Innovation.

Q4: The Yamuna is one of the most important rivers of North India. At one time, it was the lifeline for the people of the area, but today, it is the most polluted river in the country. Discuss the case study of the Yamuna River - a Polluted River in India.

Ans:- Past Significance :-

1. Lifeline :- The Yamuna was historically vital for water supply, agriculture and cultural activities.
2. Spiritual significance :- Considered sacred in Hinduism, numerous religious events were centered around it.

Current Pollution Situation :-

1. Sewage Discharge :- Massive inflow of untreated sewage from urban areas along the river.
2. Solid Waste :- Dumping of solid waste and debris into the river.
3. Industrial Effluents :- Unregulated discharge of Industrial waste containing toxic chemicals.

Consequences :-

1. Ecosystem Impact :- Aquatic life and biodiversity suffer due to pollution.
2. Health Hazards :- Contaminated water poses health risks to people using it for various purposes.
3. Agricultural Concerns :- Irrigation with polluted water affects crop quality and soil health.

Government Initiatives :-

1. Yamuna Action Plan.
2. Sewage Treatment.

Challengers :-

1. Enforcement Issues
2. Population Pressure

Solutions :-

1. Advanced Treatment :- Implement advanced sewage and effluent treatment tech.
2. Policy Strengthening :- Enforce stricter regulations and penalties for polluters.

P. "Water is vital for life". Life owes its existence and obtains its sustenance from water. Madhya Pradesh is endowed with abundant water resources but due to improper management coupled with excessive exploitation, most of the water resources are severely stressed and depleting. Discuss the Water crisis in Jabalpur, Madhya Pradesh, India.

Ans: Madhya Pradesh has rich water resources, including rivers, lakes and ground water.

### Challengers :-

1. Over Exploitation :- Excessive use for agriculture, industries, and urban areas leads to aquifer depletion.
2. Urbanization :- Rapid urban growth strains water supply and sewage systems.
3. Deforestation :- Reduced tree cover disrupts natural water cycles and leads to soil erosion.

### Effects :-

1. Water Scarcity :- Uneven distribution and mismanagement leads to shortages, especially during dry spells.
2. Agricultural Impact :- Insufficient water affects crop yield and quality, impacting livelihoods.
3. Health Risks :- Contaminated water sources pose health hazards to communities.

### Mitigation Strategies :-

1. Efficient Irrigation :- Implementing water-saving irrigation techniques in agriculture.
2. Pollution Control :- Strict regulations and treatment systems for Industries and sewage.
3. Reforestation :- Increasing green cover to enhance natural water retention.

### Community Engagement :-

1. Local Involvement :- Communities actively participating in water conservation efforts.
2. Water Users Associations :- Facilitating participatory management and equitable water distribution.

Q6. There may be a different kind of water crisis heading Mumbai's. Preliminary research on climate change suggests that the heavily populated coastal areas in Maharashtra are very vulnerable to inundation and flooding if the sea level rise due to global warming. Discuss the adverse consequences of climate change in Mumbai.

- Ans:-
1. Sea Level Rise :- Global warming leads to melting ice caps and thermal expansion, increasing sea levels.
  2. Coastal Flooding :- Mumbai, a coastal city, faces higher risks of inundation due to rising sea levels and storm surges.
  3. Infrastructure Damage :- Inundation can damage critical infrastructure, including roads, buildings, and utilities.
  4. Economic Loss :- Damage to businesses, trade and properties results in significant economic losses.
  5. Displacement :- Coastal communities could be forced to relocate due to flooding risks.
  6. Health Risks :- Inundation can lead to waterborne diseases and health hazards.
  7. Traffic Disruptions :- Flooded roads disrupt transportation and increase commuting times.
  8. Saltwater Intrusion :- Rising sea levels can contaminate freshwater sources with saltwater.
  9. Population Pressure :- Mumbai's high population density exacerbates the vulnerability and impact of climate change.

The Green Revolution in India has achieved self-sufficiency in food production. However, in the state of Haryana, this has resulted in continuous environmental degradation, particularly of soil, vegetation, and water resources. Discuss the Environmental consequences of agricultural development: a case study from the Green Revolution state of Haryana, India.

Ans:-

1. Soil Degradation :- Intensive use of chemical fertilizers and pesticides has led to soil nutrient imbalances and degradation.
2. Water Depletion :- Excessive groundwater extraction for irrigation has lowered water tables, depleting aquifers.
3. Water Pollution :- Runoff from agricultural fields carries pesticides and fertilizers into water bodies, causing pollution.
4. Biodiversity Loss :- Monoculture and reduced crop diversity have negatively impacted local ecosystems and wildlife.
5. Air Pollution :- Pesticide and fertilizer use contributes to air pollution, affecting both human health and the environment.
6. Erosion :- Removal of native vegetation for agriculture increases soil erosion and reduces soil fertility.
7. Groundwater Contamination :- Leaching of agrochemicals contaminates groundwater resources.
8. Climate Impact :- Deforestation and agricultural emissions contribute to greenhouse gas emissions and climate change.

Q8 :- India is the largest user of groundwater in the world for irrigation, domestic and industrial needs. The groundwater level in northwest India has dipped to alarming levels, especially in Punjab. Analyze the determinants of groundwater depletion in Punjab.

Ans:-

1. Over-Extraction :- Excessive pumping of groundwater for agriculture, domestic and industrial use.
2. Intensive Agriculture :- Heavy reliance on groundwater for irrigation leading to high water demand.
3. Monoculture Crops :- Dominance of water-intensive crops like paddy and wheat.
4. Lack of Diversification :- Limited crop diversification reduces efficient water use.
5. Inefficient Irrigation :- Traditional flood irrigation methods lead to water wastage.
6. Lack of Regulation :- Weak enforcement of groundwater regulations and restricted access.
7. Urbanization :- Growing population and urban expansion increase water demand.
8. Industrial Use :- Industries tapping into groundwater for their processes.
9. Climate Change :- Altered rainfall patterns impact groundwater recharge.

Discuss in detail the Chipko movement; a nonviolent social and ecological movement by rural villagers, particularly women, in India in the 1970's, aimed at protecting trees and forests slated for government-backed logging.

Ans:- The Chipko movement was a significant movement nonviolent environmental and social movement that emerged in the 1970's in India, particularly in the state of Uttarakhand. Led by rural villagers, including women, the movement aimed to protect trees and forests from government-sponsored logging activities. The term "Chipko" translates to "hug" or "embrace" in Hindi, symbolizing the villagers' practice of physically hugging trees to prevent them from being felled.

1. Villagers's Participation :- The movement was primarily led by local women, who held a direct stake in preserving the forests for their daily needs.
2. Direct Action :- Villagers engaged in tree-hugging and formed human chains around trees to protect them from loggers.
3. Policy Change :- The movement's success led to a 15-year ban on green felling in the Himalayan region.
4. Environmental Awareness :- Chipko raised public awareness about the connection b/w deforestation and ecological degradation.
5. Shift in Forestry Policies :- The government began to emphasize community participation in forest management and sustainable development.

Q10:- Discuss in detail the Narmada Bachao Andolan - an Indian social movement led by native tribes, farmers, environmentalists, and human rights activists against the construction of a number of large dams under the Narmada Dam Project across the river Narmada.

Ans:- The Narmada Bachao Andolan was a prominent social movement in India, led by indigenous tribes, farmers, environmentalists, and human rights activists. It aimed to oppose the construction of large dams under the Narmada Dam Project across the Narmada River.

The movement highlighted concerns about displacement, loss of fertile land, environmental damage and human rights violations. Led by figures like Medha Patkar, The NBA employed nonviolent protests, hunger strikes, and legal battles to draw attention to the impacts of such projects.

The movement spurred debates on development, led to court interventions, improved rehabilitation policies, and underscored the needs to balance development with social and environmental concerns.

1. Court Interventions :- Legal battles resulted in Supreme Court interventions and judgments that mandated better rehabilitation and environment impact assessment.
2. Debate and Awareness :- The movement brought national and international attention to issues of displacement, environmental destruction, and social justice.