Environment Class 14

19th March, 2024 at 9:00 AM

AIR POLLUTION (09:10 AM)

- Air Pollution can be defined as any solid, liquid or gaseous substances in such concentration in the atmosphere that it may be detrimental to human beings and other living creatures including plants or property or the environment.
- **Primary and Secondary Pollutants:**
- Primary pollutants are directly emitted by some sources, and secondary pollutants are not directly emitted but form when other pollutants react in the atmosphere.
- Examples- Acid rain (oxides of nitrogen and sulfur)
- Smog is air pollution that reduces visibility. This was used in the early 20th century to describe a mix of smoke and fog.
- Many cities in Western Europe and America, suffered from classical smog during winter.
- In many such places, classical smog is replaced with photochemical smog, it is a mixture of pollutants that are formed when nitrogen oxides, and VOCs.
- They react with sunlight and form other pollutants such as ozone and peroxyacetyl nitrate.
- This leads to a brown haze above cities often in summer because this is when sunlight is at its peak.
- **Ozone as Pollutant:**
- Tropospheric ozone is called bad ozone.
- It can cause respiratory problems, and it adversely affects photosynthesis, thus damaging plants and producing crop yields.
- It is also a greenhouse gas.
- **Point and Non-Point Sources:**
- Point sources: When sources of a pollutant are localised.
- Non-Point Sources: When sources of pollutants are distributed.
- **Gothenburg Protocol, 1999**
- To abate acidification, eutrophication, and ground-level ozone.
- It aims to reduce SO2, NOx, VOC and NH3. India is not a signatory.
- India is not a party to the Protocol.

NATIONAL AMBIENT AIR QUALITY STANDARDS (09:52 AM)

- Prepared by CPCB, it aims to indicate the levels of air quality necessary with an adequate margin of safety to protect public health, vegetation, and property.
- **The following pollutants are part of the program :**
- **1. SO2**
- **2. NOx**
- **3. PM10 (particulate matter with a size equal to or less than 10 microns meter)**
- **4. PM2.5 (particulate matter with a size equal to or less than 2.5 microns meter)**
- **5. CO**
- **6. NH3**
- **7. Lead**
- **8. Ozone**
- **9. Benzene**
- **10. Benzopyrene**
- **11. Arsenic**
- **12. Nickel.**
- The top 8 pollutants are used for the calculation of the National Air Quality Index.
- The concentration of these pollutants is measured often in micrograms/m3.
- Based on a time-weighted average, which is often taken as either a 24-hour average or an annual average.
- For some pollutants such as ozone and carbon monoxide, the time-weighted average is taken for one hour and eight hours.

NATIONAL AIR QUALITY INDEX (NAQI) (10:14 AM)

- NAQI aims to provide real-time data on air quality and convey the information to the public. It considers 8 pollutants- PM2.5, PM10, NO2, SO2, CO, NH3 and Pb.
- There are 6 AQI categories.
- The sub-indices for individual pollutants at a monitoring location are calculated using a 24-hour average concentration value (8 hours for O3 and CO). The worst sub-index is the AQI for that location.
- It is calculated only if data are available for at least 3 pollutants one of which must be PM2.5 or PM10.
- **Government initiatives:**
- Important institutions are CPCB and SPCB created.
- **National Clean Air Programme**
- It is a comprehensive strategy launched in 2019 to improve air quality in 131 non-attainment cities
- Cities that do not meet national ambient air quality standards
- The goal is a 40 percent reduction in PM concentration by 2026.
- It aims to achieve this by following
- Extensive plantation drive, technological support to states, sectoral interventions such as electric mobility, power sector emissions, indoor air pollution, city-specific plans, regional and transboundary plans
- 2. knowledge and database augmentation
- an air quality monitoring network, impact of air pollution on economy and health
- review of ambient air quality standards, institutional strengthening
- partnership with technical institutions.

BHARAT STAGE VI (10:57 AM)

- To regulate vehicles, It is equivalent to Euro VI emission standards, it reduces the allowable levels of several air pollutants. particular matter, hydrocarbons,
- Vehicles must be equipped with advanced emission control tech such as particulate filters, and selective catalytic reduction to reduce NOx emission among others
- **Electric Vehicles**
- They use batteries rather than combustion engines, thus running vehicles does not emit greenhouse gases or air pollutants, and it also does not cause noise pollution.
- It helps in the conservation of energy, however, its environmental footprint depends upon, the source of energy to charge the batteries, and battery waste management
- **Emission norms for thermal power plants:**
- CPCB has emission norm guidelines for pollutants such as particulate matter, SO2 NOX, and Mercury.
- Thermal power Plants are divided into three categories based on location:
- **Category 1: Thermal power plants around NCR and cities with more than 10 lakh population They need to comply by 2024**
- **Category 2: Around non-attainment cities by 2025**
- **Category 3: Rest of the plants by 2026**
- **Fly Ash Norms:**
- Fly ash is a by-product of burning coal.
- The government notified fly ash notification 2021 under EPA 1986, which has made it mandatory **100 percent utilisation of fly ash in an eco-friendly manner.**

CLASS TEST CONDUCTED (11:30 AM)

The topic for the Next Class: Water Pollution