FAQ's

What is environmental pollution?

Pollution is the introduction of contaminants into the natural environment that cause adverse change. Pollution can take the form of chemical substances or energy, such as noise, heat or light. Pollutants, the components of pollution, can be either foreign substances/energies or naturally occurring contaminants. Pollution is often classed as point source or nonpoint source pollution.
It was the industrial revolution that gave birth to environmental pollution as we know it today. London also recorded one of the earlier extreme cases of water quality problems with the Great Stink on the Thames of 1858, which led to construction of the London sewerage system soon afterward. Pollution issues escalated as population growth far exceeded view ability of neighborhoods to handle their waste problem. Reformers began to demand sewer systems, and clean water.

Discuss the term pollutant.

A pollutant is a substance or energy introduced into the environment that has undesired effects, or adversely affects the usefulness of a resource. A pollutant may cause long- or short-term damage by changing the growth rate of plant or animal species, or by interfering with human amenities, comfort, health, or property values. Some pollutants are biodegradable and therefore will not persist in the environment in the long term. However the degradation products of some pollutants are themselves polluting such as the products DDE and DDD produced from degradation of DDT.

Stock pollutants

Pollutants, towards which the environment has little or no absorptive capacity, are called *stock pollutants*. (e.g.

persistent synthetic chemicals, non-biodegradable plastics, and heavy metals). Stock pollutants accumulate in the environment over time. The damage they cause increases as more pollutant is emitted, and persists as the pollutant accumulates. Stock pollutants can create a burden for future generations, by passing on damage that persists well after the 'benefits' received from incurring that damage; have been forgotten.

Fund pollutants

Fund pollutants are those for which the environment has some absorptive capacity. Fund pollutants do not cause damage to the environment unless the emission rate exceeds the receiving environment's absorptive capacity (e.g. carbon dioxide, which is absorbed by plants and oceans). Fund pollutants are not destroyed, but rather converted into less harmful substances, or diluted/dispersed to non-harmful concentrations.

Discuss the different types of pollutants causing air pollution.

Notable pollutants include the following groups:

- Heavy metals: A **toxic heavy metal** is any relatively dense metal or metalloid that is noted for its potential toxicity, especially in environmental contexts. The term has particular application to cadmium, mercury, lead and arsenic, all of which appear in the World Health Organisation's list of 10 chemicals of major public concern. Other examples include manganese, chromium, cobalt, nickel, copper, zinc, selenium, silver, antimony and thallium
- Persistent organic pollutants POP: **Persistent organic pollutants** (**POP**s) are organic compounds that are resistant to environmental degradation through chemical, biological, and photolytic processes.[1] Because of their persistence, POPs

bioaccumulate with potential significant impacts on human health and the environment. The effect of POPs on human and environmental health was discussed, with intention to eliminate or severely restrict their production, by the international community at the Stockholm Convention on Persistent Organic Pollutants in 2001.Many POPs are currently or were in the past used as pesticides, solvents, pharmaceuticals, and industrial chemicals. Although some POPs arise naturally, for example volcanoes and various biosynthetic pathways, most are man-made via total synthesis

- Environmental Persistent Pharmaceutical Pollutants EPPP: The term **Environmental persistent pharmaceutical pollutants** (EPPP) was first suggested in the nomination in 2010 of pharmaceuticals and environment as an emerging issue in a Strategic Approach to International Chemicals Management (SAICM) by the International Society of Doctors for the Environment (ISDE). The occurring problems from EPPPs are in parallel explained under environmental impact of pharmaceuticals and personal care products (PPCP). The European Union summarizes pharmaceutical residues with the potential of contamination of water and soil together with other micropollutants under "priority substances"
- Polycyclic aromatic hydrocarbons: **Polycyclic aromatic hydrocarbons** (PAHs, also *polyaromatic hydrocarbons*) are hydrocarbons—organic compounds containing only carbon and hydrogen—that are composed of multiple aromatic rings (organic rings in which the electrons are delocalized). Formally, the class is further defined as lacking further branching substituents on these ring structures. **Polynuclear aromatic hydrocarbons** (PNAs) are a subset of PAHs that have fused aromaticrings, that is, rings that share one or more sides. The simplest such chemicals are naphthalene, having two aromatic rings, and the three-ring compounds anthracene and phenanthrene. PAHs are

neutral, nonpolar molecules found in coal and in tar deposits. They are produced as well by incomplete combustion of organic matter (e.g., in engines and incinerators, when biomass burns in forest fires, etc.).

- Volatile organic compounds: **Volatile organic compounds** (**VOCs**) are organic chemicals that have a high vapor pressure at ordinary room temperature. Their high vapor pressure results from a low boiling point, which causes large numbers of molecules to evaporate or sublimate from the liquid or solid form of the compound and enter the surrounding air, a trait known as volatility. For example, formaldehyde, which evaporates from paint, has a boiling point of only –19 °C
- Environmental xenobiotics: **Environmental xenobiotic** are xenobiotic substances with a biological activity that are found as pollutants in the natural environment. Pharmaceutical drug is a chemical used for the alteration, diagnosis, prevention and treatment of disease, health conditions or structure/function of the human body.
- **Pharmaceutically active compounds** (**PhACs**) are those pharmaceuticals that have by one route or another entered the environment as the parent compound or as pharmacologically active metabolites. Drugs are developed with the intention of having a beneficial biological effect on the organism to which they are administered, but many such compounds all too often pass into the environment where they may exert an unwanted biological effect

What is greenhouse effect? How does it cause global warming?

The **greenhouse effect** is the process by which radiation from a planet's atmosphere warms the planet's surface to

a temperature above what it would be without its atmosphere.

If a planet's atmosphere contains radioactively active gases (i.e., greenhouse gases) the atmosphere will radiate energy in all directions. Part of this radiation is directed towards the surface, warming it. The downward component of this radiation – that is, the strength of the greenhouse effect – will depend on the atmosphere's temperature and on the amount of greenhouse gases that the atmosphere contains.

On Earth, the atmosphere is warmed by absorption of infrared thermal radiation from the underlying surface, absorption of shorter wavelength radiant energy from the sun, and convective heat fluxes from the surface. Greenhouse gases in the atmosphere radiate energy, some of which is directed to the surface and lower atmosphere. The mechanism that produces this difference between the actual surface temperature and the effective temperature is due to the atmosphere and is known as the greenhouse effect.

Earth’s natural greenhouse effect is critical to supporting life. Human activities, primarily the burning of fossil fuels and clearing of forests, have intensified the natural greenhouse effect, causing global warming.

The mechanism is named after a faulty analogy with the effect of solar radiation passing through glass and warming a greenhouse. The way a greenhouse retains heat is fundamentally different, as a greenhouse works by reducing airflow and retaining warm air inside the structure.

Cause of global warming

Almost 100% of the observed temperature increase over the last 50 years has been due to the increase in the atmosphere of greenhouse gas concentrations like water vapour, carbon dioxide (CO_2), methane and ozone. Greenhouse gases are those gases that contribute to the

greenhouse effect (see below). The largest contributing source of greenhouse gas is the burning of fossil fuels leading to the emission of carbon dioxide.