

Pollution and the environment

Pollution, also called environmental pollution is:

- The addition of any substance (solid, liquid, or gas) or any form of energy (such as heat, sound, or radioactivity) to the environment at a rate faster than it can be dispersed, diluted, decomposed, recycled, or stored in some harmless form.

The major kinds of pollution usually classified by environment are:

- Air pollution
- Water pollution
- Land pollution.

Modern society is also concerned about specific types of pollutants such as:

- Noise pollution
- Light pollution
- Plastic pollution

Pollution of all kinds can have negative effects on the environment and wildlife and often impacts on human health and wellbeing.

Environment – A workable definition

The natural environment consist of four interlinking systems namely, the atmosphere, the hydrosphere, the lithosphere and the biosphere. These four systems are in constant change and such changes are affected by human activities and vice versa (Kumarasamy et al., 2004).

History Of Pollution

Although environmental pollution can be caused by natural events such as forest fires and active volcanoes, use of the word pollution generally implies that the contaminants have an anthropogenic source—that is, a source created by human activities.

- Pollution has accompanied humankind ever since groups of people first congregated and remained for a long time in any one place.
- Ancient human settlements are frequently recognized by their wastes - for instance, shell mounds and rubble heaps.
- Pollution was not a serious problem as long as there was enough space available for each individual or group.
- With the establishment of permanent settlements with a great numbers of people, pollution became a problem, and it has remained one ever since.

Cities of ancient times were often noxious places, fouled by human wastes and debris.

- Beginning about 10th century, the use of coal for fuel caused considerable air pollution, and the conversion of coal to coke for iron smelting beginning in the 17th century exacerbated the problem.
- In Europe, from the Middle Ages well into the early modern era, unsanitary urban conditions resulted in the outbreak of population-decimating epidemics of disease, from plague to cholera and typhoid fever.
- Through the 19th century, water and air pollution and the accumulation of solid wastes were largely problems of congested urban areas.

- With the rapid spread of industrialization and the growth of the human population to unprecedented levels, pollution became a universal problem.

By the middle of the 20th century, an awareness of the need to protect air, water, and land environments from pollution had developed among the general public.

- The publication in 1962 of Rachel Carson's book *Silent Spring* focused attention on environmental damage caused by improper use of pesticides such as DDT and other persistent chemicals that accumulate in the food chain and disrupt the natural balance of ecosystems on a wide scale.

In response, major pieces of environmental legislation were passed, such as:

- The Clean Air Act (1970) and the Clean Water Act (1972) in the (United States)
- Many other countries legislated to control and mitigate environmental pollution.

Landmark UK – Regulation/Legislation

- 1306, Edward I briefly banned coal fires in London.
- Smoke Nuisance Abatement (Metropolis) Act 1853
- John Snow in 1854 discovered that the water pump on Broad Street, Soho was responsible for 616 cholera deaths because of an old cesspit, that was leaking faecal bacteria, contaminating the pump.
- Germ theory of disease began to replace miasma theory that had lingered since the Black Death.
- During the "Great Stink" of 1858, the dumping of sewerage into the River Thames began to smell so ghastly in the summer heat that Parliament had to be evacuated.
 - The Metropolitan Commission of Sewers Act 1848 had allowed the Metropolitan Commission for Sewers to close cesspits around the city in an attempt to "clean up" but this simply led people to pollute the river.
 - In 19 days, Parliament passed a further Act to build the London sewerage system.
- "Great Smog" of 1952 - London also suffered from terrible air pollution, and this culminated in the legislative response:
 - The Clean Air Act 1956.

Pollution Acts

- Control of Pollution Act 1974
- Environmental Protection Act 1990

Climate change

- Climate Change Act 2008
- Planning and Energy Act 2008
- Energy Act 2008
- Energy Act 2010
- Energy Act 2011

Carbon credit

- A carbon credit is a generic term for any tradable certificate or permit representing the right to emit one tonne of carbon dioxide or the equivalent amount of a different greenhouse gas such as methane (tCO₂e).
- Carbon credits and carbon markets are a component of national and international attempts to mitigate the growth in concentrations of greenhouse gases.

Environmental credits between countries

Around 22% of global CO₂ emissions stem from the production of goods that are, ultimately, consumed in a different country.

However, traditional inventories do not include emissions associated with imported goods.

- While the US and many European countries have reduced their domestic emissions over recent decades, some of this reduction has been offset by increasing imports from countries, such as China, that have a more carbon-intensive energy mix.
- Even though domestic emissions have fallen 27% in the UK between 1990 and 2014, once CO₂ imports from trade are considered this drops to only an 11% reduction.
- Similarly, a 9% increase in domestic US emissions since 1990 turns out to be a 17% increase when trade is included.

Export/Import of Environmental Waste

Waste is been traded between countries:

- Some like spent nuclear fuel and plastics are imported/exported for recycling
- Other waste is exported to third world countries (in effect dumped and polluting the country it is exported to)

Enforcing/Unintentional Pollution

- Water sources have been polluted by:
 - The excess use of fertilisers that have dissolved and leached into rivers
 - High density livestock farming has caused fluid waste to leak into water sources
- Insecticides/pesticides
 - That accumulate in the food chain
 - Disrupt the natural balance of ecosystems
 - E.g. Pollinators

NOTE – Legislation on pollution is:

- Reactive
- Can have unexpected and undesirable side effects