

TD I: Generalities on Pollution

1. Definition of the environment

It is considered as the set of **natural conditions** (physical, chemical, and biological) and **cultural conditions** (sociological) in which organisms (living beings) develop within an ecosystem.

An ecosystem is mainly represented by the **set of living organisms (biocenosis)** and their **living environment (biotope)**.

2. Definition of pollution

Pollution is the **degradation of the environment** by **substances** (natural, chemical, or radioactive), **waste** (domestic or industrial), or various **nuisances** (noise, light). It can have **harmful impacts** on **human health**, the **biological quality of ecosystems**, and the **biodiversity** of the environment.

3. Definition of a pollutant

A pollutant is defined as a **biological, physical, or chemical** element (alteragenic factor) which, **beyond a certain threshold or standard**, exerts **negative impacts** on all or part of an ecosystem or on the environment in general.

4. Pathways of contamination

4.1. Atmospheric contamination:

From **incineration processes**, the main pollutants include **heavy metals** (mercury, cadmium), **volatile organic compounds**, and **persistent organic pollutants** (such as dioxins, HCl, CO). In the case of **landfills**, the pollutants mainly consist of **organic compounds** and **methane**.

4.2. Aquatic contamination:

Sources of pollution in the aquatic environment come partly from **leachates** produced by percolation of landfill waste through the soil, which eventually reach **surface and groundwater tables**.

There are also **liquid discharges** from **incineration units** (washing water). Pollutants found in leachates include **organic compounds** (e.g., phenol), **heavy metals**, **pesticides**, **nitrates**, and **pathogenic microorganisms**, as well as **soluble salts** (chlorides and sulfates).

4.2.1. Soil contamination:

Soil pollution results from **atmospheric fallout** related to incineration and landfill leachates. The main pollutants include **heavy metals**, **organic compounds**, **pesticides**, and **pathogenic microorganisms**.