

## 1. Environmental Pollution

**Environmental pollution** is the release of substances and energy from the waste products of human activities into the natural environment.

While natural processes like erosion or volcanic activity can contribute to pollution, the most significant and harmful impacts stem from **human-induced** sources.

Pollution is categorized based on the medium through which contaminants are transported: **air, water, land, and noise**.

### I. Water Pollution

Indiscriminate water usage by an expanding population and rapid industrialization has led to a severe decline in water quality.

Surface water in rivers, lakes, and canals is never truly pure, but it becomes "polluted" when the concentration of organic or inorganic substances exceeds the water's natural **self-purifying capacity**, making it unfit for use.

- **Sources of Pollution:**

- **Industrial Effluents:** Industries like leather, pulp and paper, textiles, and chemicals discharge poisonous gases, heavy metals, and chemical residuals into water bodies.
- **Agricultural Runoff:** The use of inorganic fertilizers, pesticides, and herbicides leads to chemical seepage into rivers and groundwater.
- **Cultural Activities:** Rituals, pilgrimages, and religious fairs contribute to the pollution of nearly all surface water sources in India.

- **Highly Polluted Rivers:** The **Yamuna** is the most polluted river in India, particularly the stretch between Delhi and Etawah. The **Ganga** faces severe degradation downstream of Kanpur and Varanasi.

- **Health and Policy Impacts:** Water pollution is a primary cause of diseases like **diarrhoea, intestinal worms, and hepatitis**; according to the WHO, roughly **one-fourth of communicable diseases** in India are water-borne. To combat this, initiatives like the **Namami Gange Programme** have been launched to improve river health through sewerage treatment and public awareness.

### II. Air Pollution

**Air pollution** involves the addition of contaminants—such as dust, fumes, gas, or smoke—to the atmosphere in durations and proportions that are harmful to life and property.

- **Causes:** The primary drivers are the **combustion of fossil fuels**, mining, and industrial activities.
- **Impacts:** It leads to respiratory, circulatory, and nervous system disorders. In large cities like Mumbai, air pollution often manifests as **smog** (a mixture of smoke and fog), which is highly detrimental to human health.

Internationally, air pollution is recognized as a leading environmental health risk, responsible for significant mortality in Southeast Asia.

### III. Noise Pollution

This refers to a state of bearable or unbearable noise levels caused by technological advancements and industrialization.

- **Characteristics:** It is **location-specific**, and its intensity diminishes as one moves further from the source, such as industrial zones, airports, or busy transport arteries.
- **Hazardous Trends:** Noise pollution is increasingly hazardous in Indian metropolises. Interestingly, studies have shown that **oceanic noise** has increased tenfold since the 1960s due to global shipping trade, potentially impacting marine life.

## 2. Urban Waste Disposal

Urbanization in India is often characterized by **overcrowding, congestion, and inadequate facilities**, leading to poor sanitary conditions.

**Solid waste** includes a wide variety of used articles—metals, glassware, plastic, ash, and electronic waste like CDs—dumped in various locations.

- **Classification:** Waste is generally disposed of from two sources: **household/domestic establishments** and **industrial/commercial units**.
- **Collection Gaps:** While metropolitan cities like Mumbai or Chennai collect about 90% of their waste, in smaller towns, **30 to 50 per cent of waste is left uncollected**, accumulating in streets and wastelands.
- **Consequences:** Uncollected waste creates health hazards by producing obnoxious smells and providing breeding grounds for flies and rodents, which carry diseases like **typhoid, cholera, and malaria**. Furthermore, untreated waste ferments and releases toxic biogases like **methane**.
- **Strategic Solutions:** Geographers suggest treating waste as a **resource** for generating **energy and compost**. The **Swachh Bharat Mission (SBM)** is an urban renewal initiative that aims to improve quality of life, particularly in slums, through scientific waste management.

### 3. Urbanization and Rural-Urban Migration

**Urbanization** is the process by which a population concentrates in cities, driven largely by the movement of people from rural areas. In 2011, India's urban population stood at **31.16 per cent**, and global

estimates suggest that by 2050, **68 per cent** of the world will live in cities.

- **The Migration Stream:** Rural-urban migration is driven by **push factors** (poverty, unemployment, lack of land) and **pull factors** (job promises, better amenities).
- **Socio-Economic Dynamics (The Case of Ramesh):** Ramesh, a welder, illustrates the typical migrant experience: he works in the informal sector, remits money home to support his family's consumption and education, but suffers the **pain of separation** from his family.
- **Male Dominance:** Because urban wages are often too low to support an entire family, spouses are frequently left behind in villages to care for children and the elderly, making the rural-urban stream predominantly **male-dominated**.



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### 4. The Problems of Slums

Urban centers are highly differentiated spaces, where high-income localities with wide roads coexist with

**slums and jhuggi-jhopari clusters.** Slums are residential areas of "least choice" inhabited by those who cannot afford proper urban housing.

- **Characteristics of Slums:**
  - Marked by **dilapidated houses**, poor ventilation, and extreme overcrowding.
  - Lack of basic amenities such as **clean drinking water, light, and toilets**.
  - Unregulated drainage and narrow street patterns create serious socio-environmental hazards.
- **Social and Health Vulnerabilities:** Slum dwellers typically work in low-paid, high-risk, unorganized sectors, leading to chronic undernourishment. Poverty and social exclusion make these populations vulnerable to **drug abuse, alcoholism, and crime**. Furthermore, children in slums are often deprived of school education due to their parents' inability to pay fees.
- **Dharavi:** Located in central Mumbai, it is **Asia's largest slum**, representing the extreme challenges of urban density and lack of infrastructure.

**deterioration of land quality.** **Land degradation** is the temporary or permanent decline in the productive capacity of the land.

- **Human-Induced Processes:** While natural agents cause some degradation, human actions are often more detrimental.
  - **Faulty Irrigation:** Intensive irrigation in regions like Punjab and Haryana has led to **alkalisation, salinisation, and waterlogging**, stripping the soil of its fertility.
  - **Chemical Pollution:** Overuse of fertilizers and pesticides leads to their concentration in toxic amounts within the soil profile.
  - **Cropping Patterns:** The displacement of nitrogen-fixing **leguminous crops** by multiple cropping has obliterated the soil's natural fertilization process.

- **Wastelands:** Land degradation often results in the creation of wastelands, which are more frequently the product of **man-made processes** than natural ones.

- **Watershed Management (The Jhabua Case Study):** In the backward tribal district of Jhabua (Madhya Pradesh), community participation has been used to counter resource degradation. Villagers used **"social-fencing"** to prevent open grazing and collectively managed common property resources (CPRs), successfully greening degraded lands and pastures through tree plantation.



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## 5. Land Degradation

The pressure on land resources increases not only due to population growth but also through the

Summary Table for CUET Candidates

Issue	Primary Cause/Driver	Major Geographical Impacts

<b>Water Pollution</b>	Industrial waste, agricultural runoff, cultural rituals.	Spread of water-borne diseases; degradation of Ganga/Yamuna.
<b>Air Pollution</b>	Fossil fuel combustion, mining, industrial smoke.	Smog in metropolises; respiratory and circulatory diseases.
<b>Urban Waste</b>	Overcrowding; poor municipal collection (30-50% uncollected).	obnoxious smell; disease-carrying flies/rodents; methane release.
<b>Slums</b>	Abject rural poverty; lack of affordable urban housing.	Social exclusion; poor hygiene; vulnerability to crime and drug abuse.
<b>Land Degradation</b>	Faulty irrigation; chemical overuse; deforestation.	Soil salinity/alkalisation; loss of productive capacity; wasteland creation.
<b>Rural-Urban Migration</b>	Push (poverty) and Pull (job perceived) factors.	Male-dominated urban streams; vital remittances to rural areas.

