

# **E-Waste Management**

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## E-Waste Management Towards a Sustainable Digital Future

## Introduction

- In May 2025, global tech majors LG and Samsung filed legal petitions against the Indian government, contesting the new e-waste recycling regulations that mandate a minimum payout to recyclers under Extended Producer Responsibility (EPR).
- This has reignited the debate on the **challenges**, **policy effectiveness**, and the **future of ewaste management** in India.

## What is E-Waste?

- Electronic waste (e-waste) refers to discarded electrical and electronic equipment (EEE) such as mobile phones, computers, TVs, refrigerators, etc., that are no longer useful or wanted.
- It contains:

• Valuable materials: gold, silver, copper, palladium.

• **Toxic substances**: lead, mercury, cadmium, flame retardants.

## Status of E-Waste: Global and India

- Global:
  - $\,\circ\,$  In **2022**, about **62 million tonnes** of e-waste were generated.

- Only **22.3%** was formally collected and recycled.
- According to the UN's Global E-Waste Monitor 2024, e-waste is growing 5 times faster than its recycling rate.
- India:
  - In 2023-24, India generated 1.751 million metric tonnes (MT) of e-waste a 73% increase in five years.
  - India is the third-largest e-waste generator globally after China and the USA.
  - Over **95% of e-waste** in India is handled by the **informal sector**, often using **unsafe methods** like acid baths and open burning.

#### **Impacts of Improper E-Waste Management**

- Environmental Damage:
  - Soil contamination, groundwater pollution, and air degradation due to toxic leachates and burning.
- Public Health Crisis:

Causes neurological disorders, respiratory issues, and cancer in workers and nearby communities.

• Climate Change:

• Releases methane and greenhouse gases from landfills and incineration.

- Loss of Valuable Resources:
  - India loses **\$10+ billion annually** due to poor resource recovery and pollution-related impacts.
- Biodiversity Loss:

• Ecosystem imbalance due to pollution and improper disposal methods.

## **E-Waste Management Rules in India**

• Regulated by E-Waste (Management) Rules, 2022 under the Environment (Protection) Act, 1986.

Key Features:

- Extended Producer Responsibility (EPR):
  - Producers are responsible for collection, recycling, and eco-friendly disposal of ewaste.
- Mandatory Registration:
  - All stakeholders (manufacturers, recyclers, etc.) must register on the CPCB portal.
- Environmental Compensation:
  - Fines levied for non-compliance with recycling targets.
- Floor Price for EPR Certificates:

• Protects registered recyclers and deters unsafe informal practices.

## **Challenges in E-Waste Management**

- Infrastructure Limitations
- High Costs of Advanced Recycling Technology
- Rapid Technological Obsolescence

- **Product Complexity** (multi-materials, miniaturization)
- Lack of Public Awareness
- Inefficient Collection Systems
- Dominance of Informal Sector
- Illegal E-Waste Imports

## **Way Forward**

- Expand and Modernize Recycling Facilities
- Develop Accessible Collection Points Nationwide
- Formalize the Informal Sector through incentives and training
- Strengthen Reverse Logistics Infrastructure
- Public Awareness Campaigns (IEC initiatives)
- Government-Private-NGO Partnerships for innovation
- Strict Monitoring and Enforcement by CPCB/SPCBs
- **Promote Eco-Design and Circular Economy Principles**

## Conclusion

India's expanding digital economy must be matched by a **robust, sustainable e-waste ecosystem**.

The **E-Waste (Management) Rules, 2022** are a progressive step but require **effective implementation**, **technological investment**, and **public cooperation**.

Moving towards a **circular economy** and achieving **Sustainable Development Goals (SDG 12 - Responsible Consumption and Production)** is essential for environmental sustainability and

national well-being.

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