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 e-waste 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**:
  - 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 e-waste.
- **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.