



Source: ecoideaz.com

Original Notes:

No notes

GENERATION

Original Notes:

No notes

Overview of India's e-waste scenario

Original Notes:

No notes

Overview of India's e-waste scenario

**India's per capita e-waste generation was estimated to be 2.4 kg and in absolute terms India generated an estimated 3.2 Mt.
(Source: GEM,2020)**

E-waste stream in India is one of the fastest growing waste stream.

India is one of the few countries in Asia to have a well defined e-waste management rules and legislation.

Original Notes:

No notes

Definition of e-waste

Original Notes:

No notes

E-waste

What is e-waste?

According to the **E-waste (management)Rules,2022 :**

e-waste means electrical and electronic equipment, including solar photo-voltaic modules or panels or cells, whole or in part discarded as waste, as well as rejects from manufacturing, refurbishment and repair processes.

The Gazette of India

Original Notes:

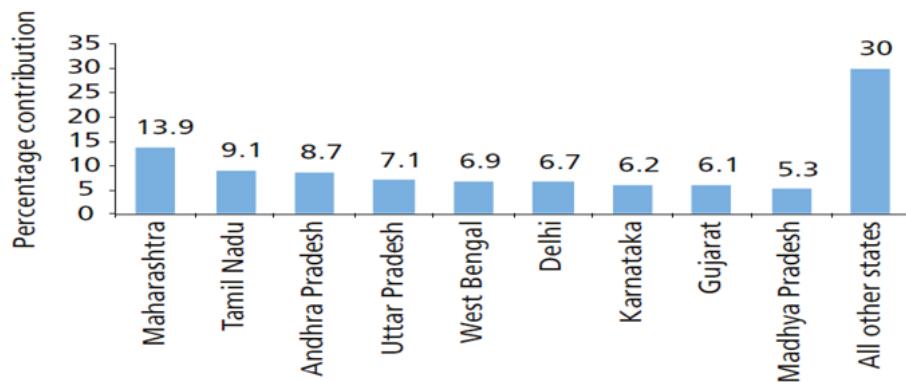
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Generation of e-waste

Original Notes:

No notes

GENERATION OF E-WASTE IN INDIA

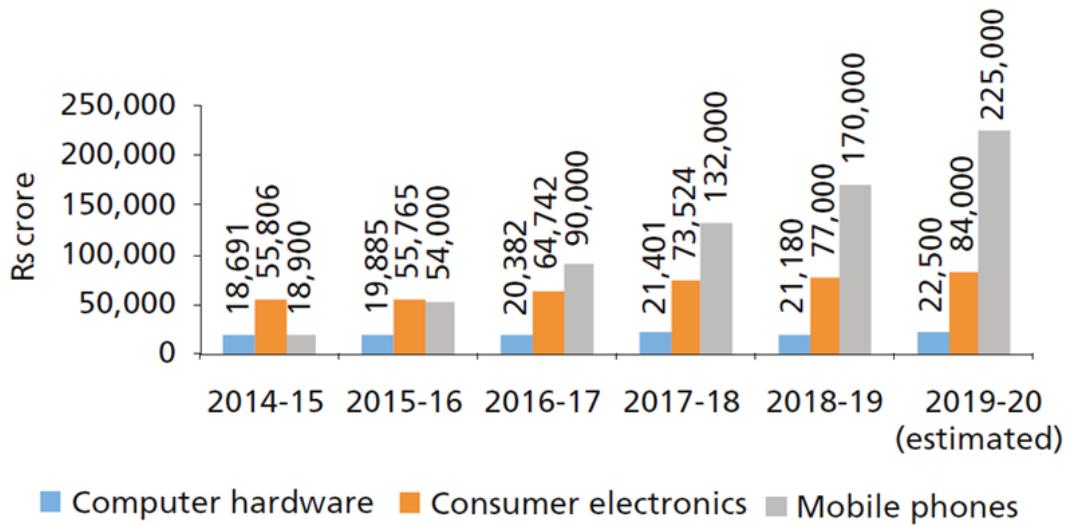


Source: Electrical and Electronics manufacturing in India, ASSOCHAM & NEC Technologies, 2018

Original Notes:

No notes

Electronics production in India



Source: Annual Report MeitY, 2019–20

Original Notes:

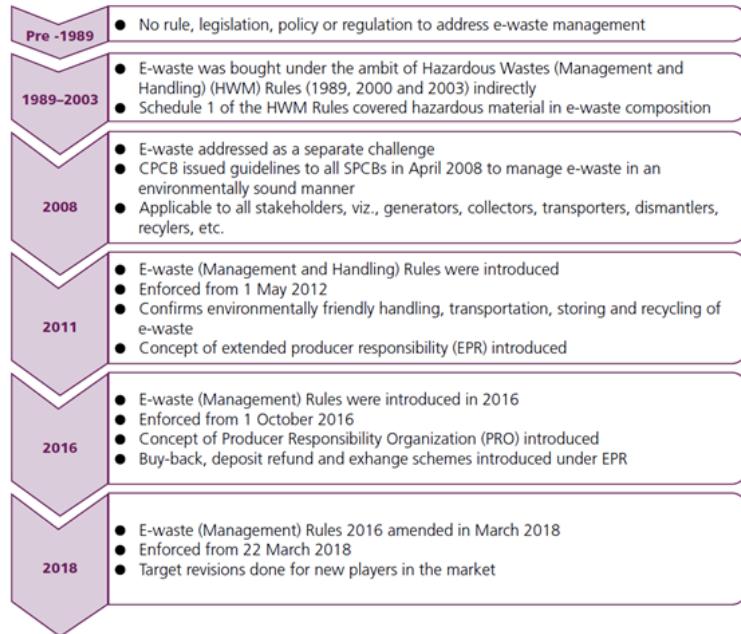
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Policy and Legislation

Original Notes:

No notes

Legislations Progress in India



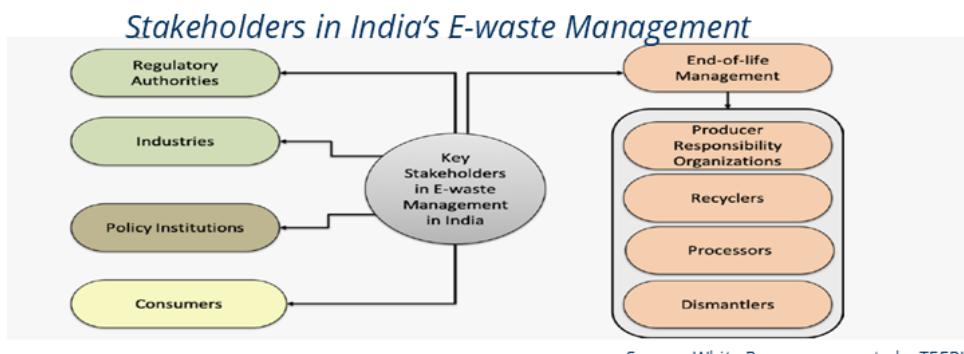
Source: CSE, 2020

Original Notes:

No notes

E-waste Management Rules, 2022

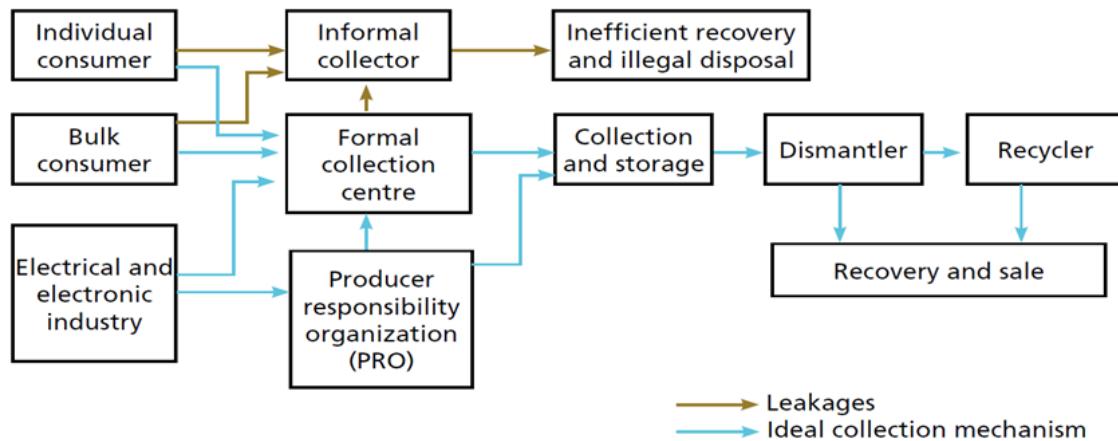
The main objective of E-waste (Management) Rules, 2023 is to achieve sustainable end of life management of e-waste. This is done by defining roles and responsibilities of all the stakeholders for proper use, safe collection, transport, dismantling, recycling, and disposal.



Original Notes:

No notes

India's E-waste Management Policy



Source: CSE, 2020

Original Notes:

No notes

Amrita's Part

Original Notes:

No notes

Collection

Original Notes:

No notes

Collection

95% of the e-waste is handled by the informal sectors (Dutta & Goel, 2021). In case of government approved formal sectors, India has currently **569 recycling facility** with a total capacity of treating more than **1.7 million metric tonne** of e-waste (Central Pollution Control Board). There are almost **3000 collection points in 22 states**. Despite of that India has only recycled **32.9% of e-waste generated in 2021-2022** (Ministry of Environment, Forest and Climate Change).

95% of the e-waste is handled by the informal sectors (Dutta & Goel, 2021).

Process of Recycling by the Formal sector :

- **Collection and Transportation.**
- **Sorting**
- **Shredding**
- **Separation**
- **Quality control**



<https://tinyurl.com/377hy42> accessed on 28-06-2023

Original Notes:

No notes

Challenges

Original Notes:

No notes

India is now the **third producer** of electronic waste generating about **3.2 million tonnes annually (2019)**. According to the E-Waste (Management) Rules (2016), **Indian government has banned import of ewaste except refurbishment and re-exportation of second-hand goods**. However, the differentiation between e-waste and second-hand goods is not very clear, making it difficult to ensure the restriction on e-waste entry. From **2019-2022, total 29 cases of illegal ewaste dumping** has been detected in the country.

Lack of knowledge and awareness of consumers on proper way to dispose ewaste is a major problem in the country.

Although Indian government has introduced scheme to partially fund e-waste management facilities, the country still has very few recognized and government-approved recycling centres to dismantle and repurpose electronic waste.

- Informal sectors hire children from age group 10-14 to engage in various e-waste activities such as dismantling, extracting useful parts and recycling. The children work for 8-10 hours in dangerous conditions suffering serious skin conditions and lung infections.



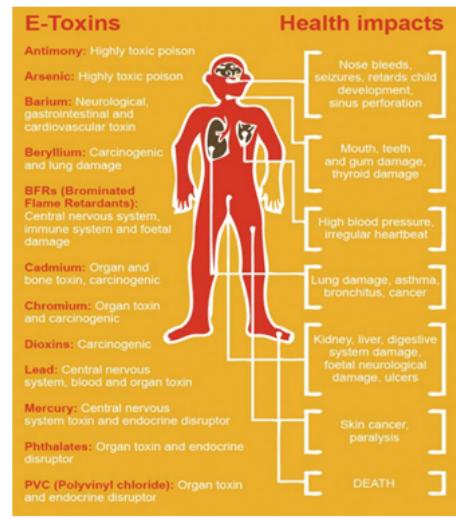
<https://www.thehansindia.com/posts/indexness/2015-06-04/Ban-child-labour-in-e-waste-Biz-AssoCham/155218>

Original Notes:

No notes

Challenges

Volume of e-waste-
Lack of awareness-
Absence of
Lack of Infrastructure-
Involvement of child labour
Lack of Incentive Scheme-
Health and Environmental Hazards-



oecd.org

Original Notes:

No notes

Solutions

Original Notes:

No notes

Solution

ISM-DEMATEL Method-The decision-making trial and evaluation laboratory (**DEMATEL**) is a mathematical method, which can be used to analyze the causal interdependence and association among the dimensions in complex management problem to resolve the issue efficiently (Tzeng et al., 2007) whereas **interpretive structural modelling (ISM)** assists individuals or groups to show domain knowledge into a model of interrelationships to enhance the understanding of its intricacy (Warfield, 1973). Both the methods investigate the cause and effect relationship among multiple criteria.

Final iteration-level partition of barriers		
Barrier code	Barriers	Level
B1	Lack of public awareness for e-waste recycling	VI
B2	Lack of policies and regulation addressing e-waste problem	V
B3	Non-adoption of Basel Ban amendment	IV
B4	Growing Informal sector	III
B5	Lack of awareness of green practices in design of electronic product	II
B6	Lack of funds for e-waste recycling practices	I
B7	Lack of CSR initiatives	V
B8	Lack of knowledge sharing between firms for green recycling practices	I
B9	Poor infrastructure	IV
B10	Lack of Extended Producer Responsibility (EPR) approaches	III

Kumar & Dixit,
2018

Extended Producer Responsibility (EPR)- Producer of EEE has the responsibility of managing such equipment after its end of life. Improvements must be done to extend the responsibilities to manufacturers and customers.

Incentive Scheme- Introduction of recycling credits or incentives to the customers and formal sectors can enhance the recycling. Incentive focusing on stakeholders encourages both demand and supply-side factors to voluntarily adopt e-waste recycling. These incentives could be in the form of **tax concessions or discounts** to ensure compliance across the electrical industry.

Original Notes:

No notes

Development of innovative technologies- Focus should be given to develop and research processes that will help to invade the recycling technology for future better implementation of e-waste management. Government should invest and promote more in this research for future sustainability of the environment. For example in current electronic products, there is an implementation of better materials and chemicals that are reducing e-waste in the air (Gupta et al. 2018).

Improvement in the e-waste management- Special focus should be given to the informal sectors since it collects 95% of e-waste. Providing upskilling and training for the informal sector players will help them to enhance the workforce and maintain the dismantling and handling of the hazardous material that is present in the E-waste (Potluri and Phani, 2018). Recognizing the stakeholders in the competitive informal sectors is the first step to create a robust e-waste management in India.

Reduce, Reuse, Recycle (RRR)



Original Notes:

No notes

References

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No notes

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Original Notes:

No notes