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E-WASTE MANAGEMENT IN INDIA

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REVIEW OF LITERATURE

According to [Garg, Neha and Adhana, Deepak (January 31, 2019] when we think of waste, we only think of garbage or solid/semi-solid waste and nothing else. E-waste has become a global problem in the last decade. India also generates a large amount of her e-waste or e-waste every year. Unfortunately, E-waste is the one that doesn't get much media coverage of. Therefore, people's awareness of E waste is quite low. E-waste recycling is a concept that is almost non-existent in India . As a result, the resulting e-waste often ends up in rivers and landfills without proper recycling or treatment. This is dangerous on several levels. For both the environment and personal health. 's current paper focuses on e-waste scenarios in India and other parts of the world.

According to other research conducted we can find that, computer devices and mobile phones in India were identified as the largest contributors of e-waste. Computers accounted for 70% of the total e-waste generated in India and telecommunications equipment accounted for 12% . Among cities, Mumbai tops the list, generating an estimated 1,20,000 tonnes of e-waste at , per year. Delhi and Bangalore ranked second with his generation e-waste at 98,000 tons and 92,000 tons respectively, and generation was his third. By state, Maharashtra ranks first with e-waste generation, followed by Tamil Nadu and Uttar Pradesh with . About 70% of heavy metals in landfills is electronic waste. Finally, the paper also proposes ways to address e-waste challenges and problems.

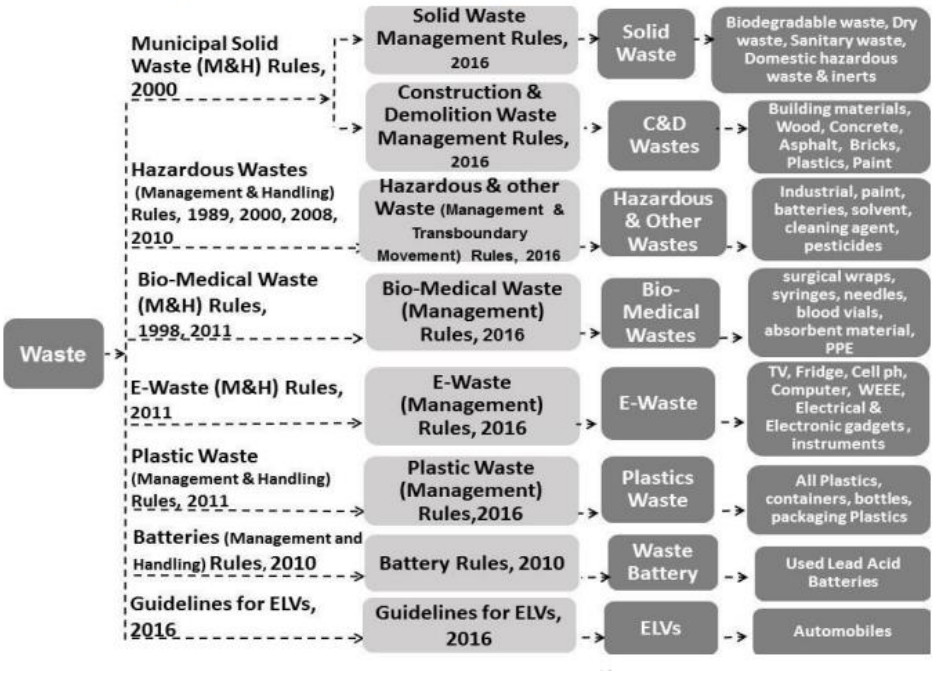
According to [Dheeraj, Nimawat & Vishal, Namdev. (2012).] , the introduction of Green Supply Chain Management and Reverse Logistics presents an opportunity for global electronics manufacturing stakeholders in the supply chain to adequately meet the international community's escalating expectations for resource conservation and profitable environmental performance. becomes. As such, the useful life of consumer electronic devices is relatively short, shortened due to rapid changes in device features and capabilities. This creates a large waste stream of obsolete electrical equipment, electronic waste (e-waste). It

consists of discarded mobile phones, computers, TV sets, batteries, microwave ovens, and other similar devices past their useful life. E-waste has become one of the top goals for companies to achieve efficient and effective supply chain performance. In addition, countries are forced to develop new models of for the collection and environmentally sound disposal of this waste. Switzerland is one of the few countries where he has more than 10 years of experience in dealing with e-waste. Egypt, on the other hand, is just beginning to experience the problems posed by e-waste. The purpose of this document is to provide comprehensive insight into the management of her WEEE in both countries. This includes funding equipment collection and recycling programs, as well as the social and environmental aspects of current practices.

In recent years, research on the sustainable management of electrical and electronic equipment (or e-waste) has received increasing attention from researchers worldwide. Studies on e-waste generation from previous publications [Ismail, H., & Hanafiah, M. M. (2020)] were reviewed to provide an overview of current research and recommendations for future research. Relevant existing studies were collected from several databases. Content analysis was used to assess three key aspects of existing research: publication distribution and trends, research scope and limitations, and current research practices and research applications. Although there was a significant upward trend in the volume of studies on the assessment of e-waste generation, the number of publications based on countries of origin was still low. Another limitation was related to differences in the choice of subjects and the level of analysis led to differences in the scope and limits of the available studies. Several other research areas were further explored based on these research findings, but the analysis of various methodological aspects was made difficult by the proliferation of new methodologies and the lack of comprehensive and up-to-date reviews of that research area. In addition, there was also a need to evaluate new and/or old technology, which led to the neglect of electrical equipment. We found that there is still a lack of comprehensive and up-to-date reviews on the methodological aspects of e-waste generation. Based on the research gaps and limitations discussed, recommendations for further research were made. Limiting this multivariate exposure pathway is a current knowledge gap that needs to be filled to better define hazard/exposure assessment. Future research needs focus on the application of modern toxicology and risk assessment tools to study people involved in e-waste recycling or living near recycling sites. The aim would be to measure electronic chemicals in exposed populations and combine these with molecular biomarker responses to better define exposure/response relationships to support operational risk assessment.

According to [Shashi Arya & Sunil Kumar (February 2020)] , as whole world is moving towards digitalization there is more production of electrical appliances, which eventually leads to more generation of e-waste. There are many policies implemented by government for recycling of e-waste. They are:

Fig. 1.1. Various Waste Management Rules Notified in India



Even though rules and policies are implemented there is still lagging in the industry of e-waste management. There are still many hazardous elements which are not properly recycled, due to this mismanagement many people are affected as those hazardous elements are not properly recycled.

Even many businesses buy machineries and other equipment's for their production and manufacturing which if the business does not keep changing with the emergence of new technology the business will lack behind which is not a good scenario. So, this also leads to many disposals of electronic waste which are outdated.

Even though India has increased e-waste collection and processing by four times in four years, 95% of e-waste is illegally handled by the informal sector. The informal waste pickers, known as kabadiwalas, do not follow environmental standards and burn materials that cannot be recycled or divert to landfills, potentially causing severe environmental damage and health hazards.

Furthermore, recyclers in the informal sector use rudimentary recycling techniques that can release toxic pollutants into the surrounding environment. Many hazardous substances in e-waste are extremely dangerous to human health and the environment.

According to [Sharma & Hussain, 2018]the 2016 E-waste management rules have been amended by the centre on 22nd march ,2018 to facilitate and effectively implement the environmentally sound management

of e-waste in India. These amendments have been made with the objective of channelizing the e-waste generated in the country towards authorized dismantlers and recyclers in order to further formalize the e-waste recycling sector. The amended Rules revise the collection targets under the provision of EPR with effect from 1st October 2017. By way of revised targets and monitoring under the Central Pollution Control Board (CPCB), effective and improved management of e-waste would be ensured. As per the revised targets of e-waste collection, 10% of the quantity of waste generated shall be collected during 2017-2018. Further, there shall be a 10% increase every year until the year 2023. After 2023, the E-Waste collection target has been fixed at 70% of the quantity of waste generation. Separate collection targets have been introduced for new producers who have recently begun their sales operations. These would be producers whose sales operations are lesser than the average life of their product. To undertake the activities prescribed for PROs under these Rules, the PROs shall apply to CPCB for registration. This is a significant and noteworthy amendment as the requirement of PROs to register with CPCB would ensure that CPCB can constantly supervise and keep a check on the activities of PROs.

According to [Nextias.com – e-waste management rules, 2022] the government has recently notified E-waste (management) rules 2022 that will come into force from **1 April 2023**.

The highlights in these rules are as follows:

- **Application:**
  - It will apply to every manufacturer, producer, refurbished, dismantler and recycler involved in manufacturing, sale, transfer, purchase, refurbishing, dismantling, recycling, and processing of e-waste or electrical and electronic equipment.
  - The rule is applicable to all electrical devices and radiotherapy equipment, nuclear medicine equipment and accessories, Magnetic Resonance Imaging (MRI), electric toys, air conditioners, microwaves, tablets, washing machine, refrigerator and iPad among others.
- **Restrictions:**
  - The government has restricted the use of hazardous substances in manufacturing electrical and electronic equipment (EEE) following deaths due to exposure to radioactive material.
    - It mandates the reduction of the use of lead, mercury, cadmium among others in the manufacturing of electronic equipment.

- **Reuse and recycling:**
  - Manufacturers shall use the technology or methods so as to make the end product recyclable and shall ensure that components or parts made by different manufacturers are compatible with each other so as to reduce the quantity of e-waste.
- **Strict monitoring:**
  - The Central Pollution Control Board shall conduct random sampling of electrical and electronic equipment placed on the market to monitor and verify the compliance of reduction of hazardous substances provisions.
    - If a product does not comply with the e-waste management rules, the manufacturer will have to withdraw all samples from the market.
- **Extended Producer Responsibility Certificates:**
  - Draft rules aim to incentivise registered electronic waste recyclers by introducing EPR or Extended Producer Responsibility certificates (which was not part of 2016 Rules).
- **E-waste exchange facilities:**
  - The EPR requires producers to set up e-waste exchange facilities to facilitate collection and recycling and assign specific responsibility to bulk consumers of electronic products for safe disposal.
- **Imports:**
  - Imports or placement in the market for new electrical and electronic equipment shall be permitted only for those which are compliant with provisions laid down by the government.
- **Disposal:**
  - It is the responsibility of the manufacturer to collect e-waste generated during manufacture and to ensure its recycling or disposal.

However, the rule does not apply to waste batteries, packaging plastics, micro enterprises, and radio-active waste, as covered under the provisions of the law.

So, from the above information's gathered using different resources we came across that many policies and rules have been implemented by the govt for the disposal of e-waste properly and effectively. But these rules need to be changed or updated in the coming years due to changing technological domain in the country and in global aspect. As more high-tech technology is being developed which are being used by different business so to reduce e-waste proper production of machines and electrical appliances need to be developed which would not be disposed on a short span of time.

References

[Garg, Neha and Adhana, Deepak, E-Waste Management in India: A Study of Current Scenario (January 31, 2019]

[Dheeraj, Nimawat & Vishal, Namdev. (2012). An Overview of Green Supply Chain Management in India. Research Journal of Recent Sciences]

[Ismail, H., & Hanafiah, M. M. (2020). A review of sustainable e-waste generation and management: Present and future perspectives. *Journal of environmental management*, *264*, 110495. https://doi.org/10.1016/j.jenvman.2020.110495

(*E-waste in India at a Glance: Current Trends, Regulations, Challenges and Management Strategies*, 2020)

Sharma, & Hussain. (2018, April 26). *e-waste management in india*. www.mondaq.com.

https://www.nextias.com/current-affairs/11-11-2022/e-waste-management-rules-2022. (n.d.). *Nextias*.