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Management of E-waste and its Future Prospective Importance

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Abstract: ***Electronic waste, often known as E waste, refers to abandoned or unwanted electrical or electronic equipment or parts. Rapid obsolescence and penetration rates will cause crises in developing countries such as India. The majority of E-waste generated in India is generated in big cities such as Mumbai, Kolkata, Delhi, Bangalore, Mumbai, and so on. Within Maharashtra, Mumbai, often known as the Oxford of the East and home to a variety of companies, particularly in the IT sector, ranks high on the list of cities in India that generate a lot of E garbage. The majority of E waste in Mumbai is disposed of in landfills or incinerated, whereas the formal industry is facing problems due to a lack of E waste-waste model rate is extremely increasing daily, particularly for a few key products as a result of changes in technology, fashion, and people's per capita earnings. In general, the Mumbai Municipal Corporation and various firms have committed to processing only a small fraction of the total E garbage generated. E garbage management is a critical task since e-waste poses a risk to people. Authorities pass an E waste control law, but without political will, it is not properly implemented. A few examples of e-waste are discarded computers, audio equipment, cell phones, electric lamps, fax machines, copiers, stereos, VCRs, televisions, batteries, and so on. This garbage contains non-biodegradable polymers that pose a serious threat to the environment.***

Keyword: waste, WEEE, Research Review, E-waste management; environmental challenges; health impacts; E-waste estimation; E-waste prediction; sustainable management; public awareness

I. INTRODUCTION

Electronic waste product (E-waste) refers to discarded or end-of-life consumer electronics items such as computer systems, devices used in Communication and Information Technology (ICT), household devices, sound and video clip products, and all of their peripherals. The serious negative impacts of e waste may be on earth by seeping of toxic contents from landfills into water tanks to There is no standard format or commonly understood meaning of e waste in the world. In most cases, e trash consists of relatively expensive and generally long-lasting devices used for information processing, entertainment, or telecommunications within individual enterprises and households.

E-waste is not hazardous if it is stored in a secure location, recycled using medical methods, or moved from one location to another in parts or in total within the informal sector. When recycled using rudimentary processes, e-waste may be considered harmful. E-waste contains a variety of components, such as heavy metals, plastics, and entire glass, which are potentially harmful and hazardous to human health and the environment if not processed in accordance with an eco-audio approach. Primitive e-waste recycling within the conformal market has the potential to harm the environment. Toxic contamination of streams, other water sources, and wells due to emissions of burning and industrial waste gases. If the recycling procedure is not carried out correctly, it may cause harm to man through inhalation of fumes during recycling, communication of your skin of the employees with dangerous things, and communication during acid therapy used in the healing procedure.

Toxic and hazardous compounds found in garbage include lead (Pb) and cadmium (Cd) in printed circuit boards (PCBs). Most electric products/assemblies, cathode ray tubes (CRT), and so on contain significant amounts of lead. Cadmium is utilised in monitors and CRTs, while mercury may be included in flat screen displays and switches. Mercury has also been detected in CFLs, relays, and other specific products and solutions. Apart from being used in laptop power packs, cadmium is also used for coating metallic enclosures/ metallic components within sub-assemblies. When brominated flame retardant on manufactured and printed circuit boards, clear plastic casings, cable as well as polyvinyl chloride (PVC) cable sheathing for PBD/PBDE and insulation wearing transparent plastic periods of appliances, polychlorinated biphenyls are identified. So far, no highly sought-after study has been designed to learn the impact of e-waste on the ecosystem. Despite this, not many NGOs have realised that recycling e-waste in a semiformal field is risky. These units employ anti-environmental, anti-scientific, and primitive tactics. Because the devices are working in an unorganised industry, no information can be collected to corroborate the claim that they are infringing the current laws and regulations for work, environmental safety, and sector.

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A. *Need of study*

Waste from Electronic and Electrical Equipment (WEEE) is saved, prepared, recycled, reused, and finally disposed of in such a way that there is almost no special attention paid to the control of the e-waste produced in this specific manufacturing belt, which also houses a large number of InfoTech parks, particularly in New Mumbai and Mumbai.

There is an urgent need for a fully orchestrated process for the collection, disposal, and treatment of e-waste in this area. As a result, MPCB has designated e-waste as a high-priority area and has established the mechanism for forming the appropriate workgroup for the Mumbai region.

B. *Objective*

1) To study and identify the risks and opportunities associated with e-waste management, as it is a rapidly emerging environmental issue.
2) To identify various e-waste management rules and policies in India.
3) To create appropriate environmental assessment, implementation, and monitoring activities connected to various E-waste collection and the associated advantages in order to improve present E-waste management practises.
4) To create an E-waste management methodology.

II. METHODOLOGY

A systematic process was used to learn about E-waste control based on study work conducted. The study approach specifies the specifics - the nuts and bolts of implementation.

The following components were included in the study design for this analysis:

1) Creating the exploratory and descriptive paragraphs
2) Determining the sampling progression and size.
3) Defining the essential information, scaling methods, and measuring scales.
4) Questionnaire development and testing.
5) Data collection and analysis.

III.RECOMMENDATIONS FOR MANAGEMENT OF E-WASTES

A. *Inventory Management*

Controlling the materials utilised in the production process is essential for reducing waste formation. The size of waste generated can be decreased by reducing both the extent of hazardous materials employed in the progression and the amount of surplus raw materials in stock.

This can be accomplished through two actions: Establishing material-procure review and organise procedures and an inventory tracking system. Another inventory management strategy for waste reduction is to ensure that just the required quantity of a resource is stocked.

B. *Volume Reduction*

Volume reduction procedures are those that separate the hazardous proportion of a waste from the non-hazardous portion. These approaches are typically used to reduce the volume, and thus the cost, of a waste material. Gravity and vacuum filtration, ultrafiltration, reverse osmosis, freeze vaporisation, and other techniques are used. A maker of electronic modules, for example, can utilise compaction equipment to reduce the volume of discarded cathode ray tubes.

C. *Recovery and Reuse*

Waste can be collected on-site, at an off-site recovery facility, or through inter-industry recycling. Reverse osmosis, electrolysis, condensation, electrolytic recovery, filtration, centrifugation, and other physical and chemical processes are available to recover waste.

Sustainable Product Design: Efforts should be made to create a product that has less hazardous materials. Renewable materials and energy should be pushed, such as bio-plastics, bio-based toners, glues, and inks, and so on.

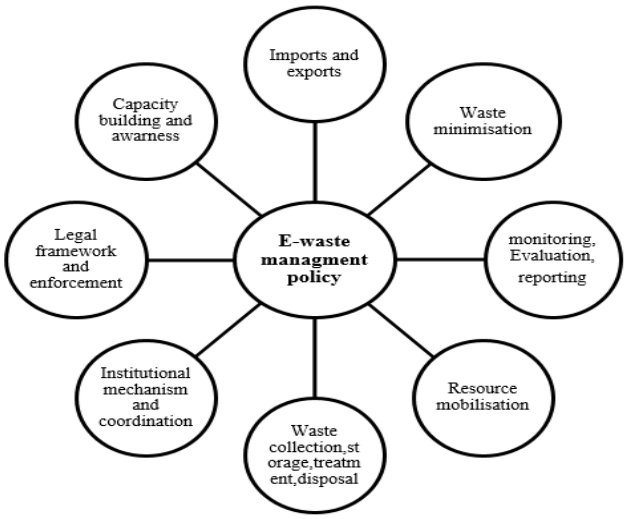

Fig. 1 Integrated Approach for Improvement in E-Waste Management Systems

IV. POSSIBILITIES OF E-WASTE MANAGEMEN

A. Recycling

Recycling is one of the most efficient methods of dealing with electronic trash. Recycling helps to limit the amount of electrical waste that ends up in landfills while also saving important resources. Recycling also contributes to a reduction in the number of harmful materials that end up in the environment. Electronic trash recycling can result in the recovery of valuable resources such as gold, copper, and aluminium.

B. Reuse

Electronic gadgets that are still in good working order can be repurposed. Reusing electrical gadgets helps to extend their lives and lowers electronic waste. Refurbished and resold electronic devices reduce the need for new electronic devices.

C. Legislation

Legislation can aid in the management of electronic waste. Manufacturers can be required by law to return their products at the end of their useful life. This ensures that electronic items are appropriately disposed of and are not illegally exported to poor countries. Manufacturers may also be required by law to employ environmentally friendly materials in their goods.

V. CONCLUSIONS

E-waste management is a critical issue that the mumbai municipal corporation (bmc) must address. The bmc's efforts to manage e-waste are excellent, but more has to be done to raise public awareness and strengthen e-waste infrastructure. To build a sustainable and effective e-waste management system, the government, ngos, and private organisations must collaborate. Mumbai (bmc) has taken many initiatives to efficiently handle e-waste. To promote sustainable e-waste management, the city administration has established collection centres, implemented recycling practises, conducted awareness programmes, and approved epr regulations. However, there is still a long way to go, and ongoing efforts are required to improve the city's e-waste management.

REFERENCES

[1] Madkhali, H., Duraib, S., Nguyen, L., Prasad, M., Sharma, M., & Joshi, S. (2023). A Comprehensive Review on E-Waste Management Strategies and Prediction Methods : A Saudi Arabia Perspective. 163–179.

[2] Kumar, S., Agarwal, N., Anand, S. K., & Rajak, B. K. (2022). E-waste management in India: A strategy for the attainment of SDGs 2030. Materials Today: Proceedings, 60(xxxx), 811–814. https://doi.org/10.1016/j.matpr.2021.09.296

[3] Appolloni, A., D'Adamo, I., Gastaldi, M., Santibanez-Gonzalez, E. D. R., & Settembre-Blundo, D. (2021). Growing e-waste management risk awareness points towards new recycling scenarios: The view of the Big Four's youngest consultants. Environmental Technology and Innovation, 23, 1–14. https://doi.org/10.1016/j.eti.2021.101716

[4] Xavier, L. H., Giese, E. C., Ribeiro-Duthie, A. C., & Lins, F. A. F. (2021). Sustainability and the circular economy: A theoretical approach focused on e-waste urban mining. Resources Policy, 74(August), 101467. https://doi.org/10.1016/j.resourpol.2019.101467

[5] Attia, Y., Soori, P. K., & Ghaith, F. (2021). Analysis of households' e-waste awareness, disposal behavior, and estimation of potential waste mobile phones towards an effective e-waste management system in dubai. Toxics, 9(10). https://doi.org/10.3390/toxics9100236

[6] Tang, J., Lin, M., Ma, S., Yang, Y., Li, G., Yu, Y., Fan, R., & An, T. (2021). Identifying Dermal Uptake as a Significant Pathway for Human Exposure to Typical Semivolatile Organic Compounds in an E-Waste Dismantling Site: The Relationship of Contaminant Levels in Handwipes and Urine Metabolites. Environmental Science and Technology, 55(20), 14026–14036. https://doi.org/10.1021/acs.est.1c02562

[7] Xavier, L. H., Ottoni, M., & Lepawsky, J. (2021). Circular economy and e-waste management in the Americas: Brazilian and Canadian frameworks. Journal of Cleaner Production, 297, 126570. https://doi.org/10.1016/j.jclepro.2021.126570

[8] Mahmud, I., Sultana, S., Rahman, A., Ramayah, T., & Cheng Ling, T. (2020). E-waste recycling intention paradigm of small and medium electronics store managers in Bangladesh: An S–O–R perspective. Waste Management and Research, 38(12), 1438–1449. https://doi.org/10.1177/0734242X20914753

[9] Twagirayezu, G., Irumva, O., Uwimana, A., Nizeyimana, J. C., & Nkundabose, J. P. (2021). Current Status of E-waste and Future Perspective in Developing Countries : Benchmark Rwanda.8(1), 1–12. https://doi.org/10.13189/eee.2021.080101

[10] Islam, A., Ahmed, T., Awual, M. R., Rahman, A., Sultana, M., Aziz, A. A., Monir, M. U., Teo, S. H., & Hasan, M. (2020). Advances in sustainable approaches to recover metals from e-waste-A review. Journal of Cleaner Production, 244. https://doi.org/10.1016/j.jclepro.2019.118815

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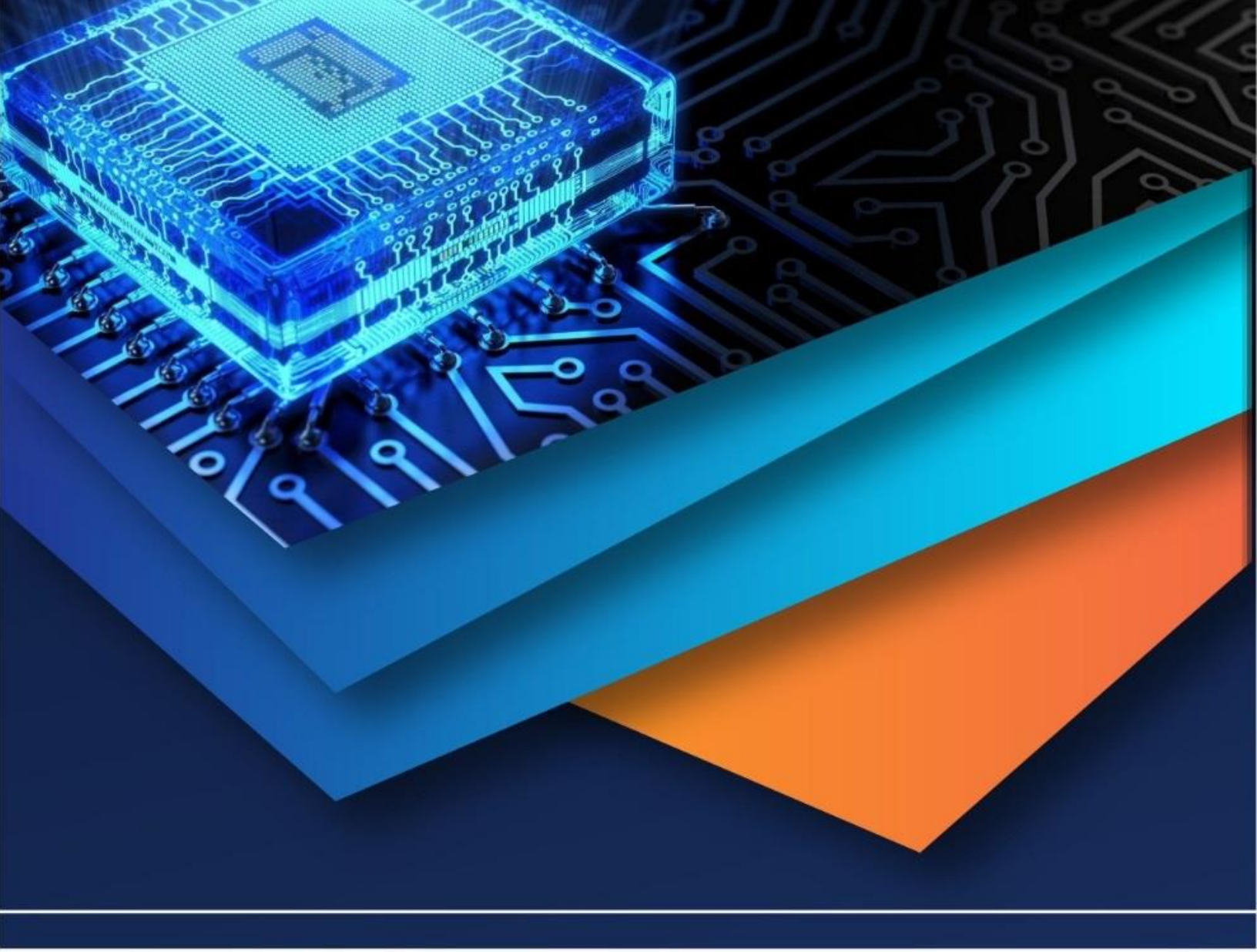

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