AWARENESS, ATTITUDE & PRACTICES TOWARD PLASTIC AND E-WASTE

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Abstract
The topic of Plastic and e-waste management has more far-reaching consequences than we can't imagine. Our age is witnessing the widespread use of plastics in nearly every aspect of life, whether the packing, case, or product. With an annual growth rate of 3–4 percent, electronic garbage (e-waste) is the fastest increasing waste globally. E-waste output is expected to reach 52.2 million tons per year by 2021. Currently, only 15% of e-waste gets recycled. When we consider the amount of this waste being generated, we know the harsh impact and the need to adopt methods that control the generation of Plastic and e-waste. Because plastics never entirely dissolve, the more plastic garbage produced, the more significant the environmental impact. The 21st century can also be classified as the digital generation with ever-improving technologies, resulting in obsoleting previous-generation technologies and increasing e-waste every day in large quantities. Considering the above factors, a study was conducted to acquire standard data about India's awareness, attitude, and practice toward Plastic and e-waste among individuals. This cross-sectional investigation was carried out using a well-designed questionnaire. Educating people about Plastic and e-waste management has become critical to preventing environmental impact and finding innovative strategies to battle this problem. In addition, we discuss their limitations, benefits, and potential for future improvement.

Keywords: e-waste, Plastic, India, waste, awareness.

Introduction
The climate wherein we live is significant, and it legitimately influences our lives. It is said that man is the result of his current circumstance. The environment is a global problem. It has no bounds. Many attempts are being conducted worldwide to raise public awareness about environmental conservation. Inadequate management of Plastic and e-waste disposal is one of the leading sources of ecological corruption. Plastics are typically high-molecular-mass polymeric polymers with certain additives. As a result of plastic pollution, toxic toxins injure humans, animals, and plants. Plastic

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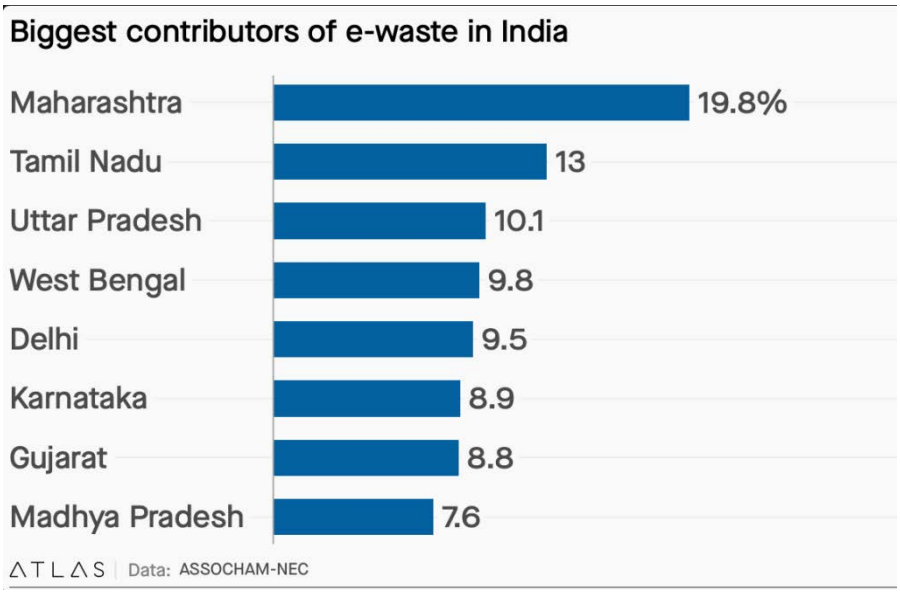
may take several years to degrade, and the damage to the environment will endure for a long time. E-waste or electronic waste defines electronic items that are recycled. E-waste is often known as used electronics planned for renovation, recycling, reselling, and salvage recycling by material recovery or disposal. The research shows that many people find electronic waste and Plastic's impact a grave and grave issue. However, people are still not aware of the effects, so the recycling rate is lower. Once we set up a plan, e-waste removal is not that hard. Proper recycling of such products helps guarantee that the air, soil and rivers cannot end up polluting it.

A clean environment benefits people's health and improves their quality of life. Plastic and e-waste pollution has been rising day by day for various reasons, including population increase, urbanization, and excessive purchasing of electrical gadgets and goods. Still, people are uninformed of the materials used in electrical items, and industrialization, among others. As a result, there is a need to educate individuals or make them more aware.

The mammoth generation of e-waste has created a new e-waste stream in the country containing obsolete, End of life Electrical and Electronics Equipment discarded after their intended use. The innovation, dynamism in product design and globalization replaced this equipment in duration and made it the fast-growing waste in the world. E-waste is generated by both indigenous and outsourced electrical and electronics equipment besides Basel Convention. In India, the know-how and appropriate infrastructure for e-waste treatment is limited, and informal recycling has thrived thanks to a flexible regulatory framework. The presence of poisonous and hazardous compounds in e-wasted equipment drew the attention of the country's waste management organizations since these substances damage human health and the environment wherever they are present in uncontrolled settings. Because of obvious reasons, the presence and implementation of Environmentally Sound Management are limited and progressing slowly. E-waste also contains a significant quantity of precious recyclable materials, making it a potentially profitable enterprise in the country. The official recyclers have built sophisticated e-waste treatment facilities. Still, they are insufficient compared to the country's e-waste creation, while the informal recyclers handle 95 percent of the e-waste created using hazardous techniques. The collecting of official e-waste from all sources is uncertain.



The study significantly made people think more about the topic and their actions. It allowed them to find their knowledge level and perception of Plastic and e-waste management. As a result, now is the moment for individuals to learn about the adverse impacts of Plastic and e-waste, modify their attitudes about their use, and practice correct management.

Literature Review

According to a review of e-waste studies, the trend of study issue has switched to leveraging cyber-physical systems (CPS) to foster symbiosis among stakeholders. Ravindra and Mor (2019) have studied that the electronic sector's rise and the higher speeds of changes in technology resulted in the large amounts of production of electrical waste and electronic materials. The study shows that the different management practices and generation of e-waste are obeyed in Chandigarh, India. The result shows that only 30% of people have an idea about e-waste and its risks to the surrounding. 12% of people were aware of the rules of e-waste. 10% had an idea of where to collect the e-waste trash. And 2% had a vision of using it.

So because of their terrible working situation, the workers may get colossal health risks. Also, the report recommends that the e-waste should be collected and circulated. (Mohan et al.)(2020) they have studied that the objective of the research is to examine the mode of waste generation and disposal in a village in Punjab to get to know the effect on the people's lives. They conducted a survey and conducted interviews with community leaders. The outcome reveals various issues, such as improper garbage disposal and multiple ailments. As a result, the study provides a detailed picture of the village's existing waste and sanitation management status. Ravinder and Shavesta (2015) studied the awareness of the risk of plastic bags among the people in Ludhiana, Punjab. Their study was done on some teachers and students. And the aim was to find the awareness of people about the risk of plastic bags and find the usage of plastic bags. Most people were using plastic bags in their day to day lives, which was also the key or primary reason for the pollution apart from the massive production of plastic bags in their marketplace. **(**Gupta et al.)(2015**)** they have studied the awareness of plastic medical or biomedical waste (BMW) among private doctors in the area of Amritsar, India. This research shows that most doctors were unaware of several types of biomedical waste. Plastic Waste Management has become a grave concern globally. He says this issue is the lack of responsibility and proper approach towards waste techniques, adequate management skills and adequate care for diseases. He observed that more than 4000 tons of waste are being generated in Ranchi itself. Researches indicate that waste disposal requires 2700000 square metres of landfill up to 2030. (Aman, 2020) The plastic waste collection is done by sorting the waste during garbage pickup from homes and through the help of separate dustbins for solid and plastic waste. Plastic waste constitutes 28% of the total waste output in Jharkhand. The dumping of plastic waste is dependent on the site condition. The disposal action is then carried forward with sanitary landfill treatment.

A central dumpsite in Jharkhand is The dumpsite in Jhirri Thana, Ranchi. (Srivastava, 2020) Jamshedpur's private municipal corporation, managed by TATA STEEL (JUSCO), took giant steps toward E-waste management. An E-waste management centre has been established where electronic waste can be exchanged at fixed prices. Jamshedpur generates about 1500-2000 metric tonnes of e-waste annually. The expanding population and a lack of information about plastic waste management solutions pose a significant concern shortly. (Mishra et al.) While the local government is usually in charge of executing municipal solid waste management programmes and infrastructure, proactive communities are frequently involved in solid waste management planning. Integrated Solid Waste Management (ISWM) is comprehensive waste prevention, recycling, composting, and disposal program.

It has also been estimated that by 2021 generation of electronic waste will increase up to 52.2 million tonnes per year. The quality of recycled plastics depends on the product input and the recycling process. The authors Tiwari and Dhawan (2014) write that 70 per cent of total e waste generation in India is from government ,public & private, industrial sectors. The individual household adds in a relatively small amount that is fifteen per cent and the remaining is generated from producers & manufacturers. The main difficulties identified in e-waste plastics recycling are (1) the presence of brominated flame retardants; (2) sorting limitations due to black plastics; (3) presence of plastic additives; (4) significant ranges of polymers together with a lack of monitoring of the treatment inputs and limited technologies to sort and recycle them (Buekens and Yang, 2014; Deloitte et al., 2015; Ma et al., 2016; Sahajwalla and Gaikwad, 2018).

Aim of the Study

The present study was undertaken to fulfil the following objectives:

1. To study Awareness of Plastic and E-waste.
2. To study Attitude towards Plastic and E-waste.
3. To study Practices toward Plastic and E-waste management.

Research Methodology

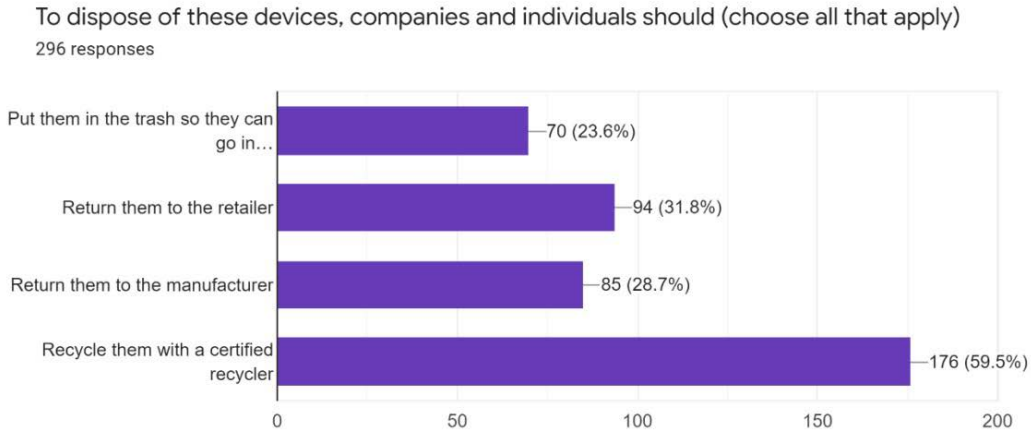
An anonymous cross-sectional survey was conducted online through questionnaires from the 6th of October to the 29th of October,2020. A total of 296 responses were recorded from different occupational individuals.

Data Analysis and Interpretation

47.3% of the respondents were female, which accounted for 140 respondents of the total respondents, 51.4% of the respondents were male, which accounted for 152 respondents of the total respondents,0.7 % of the total respondents were lesbian, which accounted for two respondents of the total respondents,0.3 % of the respondents were gay which accounted to 1 respondent of the total respondents, and 0.3% of the respondents chose the invalid option which accounted to 1 respondent of the total respondents.

Respondents between the age of 18-24years old had the highest response rate with 72.6%(215 respondents), respondents under the age of 18 had the second-highest response rate with 13.5%(40 respondents), respondents between the age of 25-39 years old had the response rate 10.1%(30 respondents), respondents between the age of 40-59 years old had the response rate of 3%(9 respondents) and the respondents with 60+ age had a response rate of 0.7%(2 respondents). 57.1 %of the respondents are graduates (169 respondents),19.3% of the respondents have done their high school education(57 respondents),17.9% of the respondents have done post-graduation, and other higher education(53 respondents) and 5.7% of the respondents have done primary education(17 respondents). 31.4% of the respondents have an annual family income of 510 lakhs(93 respondents),30.1% of the respondents have a yearly family income of 10-20 lakhs(89 respondents),25.3% of the respondents have an annual family income of fewer than five lakhs(75 respondents),6.8% of the respondents have a yearly family income of 20-50 lakhs (20 respondents) and 6.4% of the respondents have an annual family income of more than 50 lakhs(19 respondents). 34.5% of the respondents know a bit about the materials used in electronic products(102 respondents),24.3% of the respondents know more than average about the materials used in electronic products(72 respondents),22% of the respondents don't know much about the materials used in the electronic products(65 respondents),9.1% of the respondents don't know anything about the materials used in the electronic products(27 respondents),7.8% of the respondents know quite a lot about the materials used in the electronic products(23 respondents) and 2.4% of the respondents know about all the materials used in the electronic products(7 respondents). 40.5% of the respondents have partial knowledge about the electronic materials that are hazardous to the environment (120 respondents),39.2% of the respondents have proper knowledge about the electronic materials that are hazardous to the environment (116 respondents), and 20.3% of the respondents do not know the electronic materials that are hazardous for the environment(60 respondents).

35.8% of the respondents view e-waste as a severe problem (106 respondents),21.6% of the respondents view e-waste as a severe problem(64 respondents),20.6% of the respondents view e-waste as a neutral problem(61 respondents),14.2% of the respondents view e-waste as a severe problem(42 respondents) and 7.8 % of the respondents view e-waste as not a severe problem(23 respondents). 68.9% of the respondents purchase 1-3 electronic products a year(204 respondents),15.9% of the respondents purchase 4-6 electronic products a year(47 respondents),8.4% of the respondents purchase more than six electronic products a year(25 respondents) and 6.8% of the respondents purchase no electronic products a year(20 respondents). 42.6% of the respondents consider the comparison of the price of repair and cost of replacing(126 respondents),20.6% of the respondents believe the availability of the spare parts before choosing to repair(61 respondents),17.6% of the respondents consider the warranty of the product before deciding to improve (52 respondents),10.5% of the respondents think the knowledge of skills needed to fix before choosing to repair(31 respondents) and 8.8% of the respondents believe the need to disassemble the product before deciding to improve (26 respondents).



59.5% of the respondents suggest recycling the products with a certified recycler (176 respondents),31.8% of the respondents recommend returning the product to the retailer(94 respondents),28.7%of the respondents suggest returning the products to the manufacturer(85 respondents) and 23.6% of the respondents recommend to put them in the trash so that they can go in a landfill or incinerator.

Conclusion and Recommendation

Plastic and E-waste are a massive problem for our society as they have hazardous effects on nature and the human body. The most effective strategy to address this issue is to handle these wastes as scientifically as possible. The government must implement more recycling programmes to transform these wastes into energy and reduce their disposal.

The continuous rise in the population of India has led to a steep increase in the amount of solid waste generated, particularly from urban areas, which ultimately deteriorates soil and water due to unscientific disposal methods. Plastic forms an essential constituent in the composition of the urban MSW because of its increasing use in our everyday lives and therefore requires the selection of a sustainable management option which is currently absent in the existing policy framework of India. Bhagat et al. (2016) have studied the Multi-Criteria decision analysis approach (MCDA) to evaluate different waste disposal options for arriving at the most sustainable option for managing and disposal of plastic waste in Delhi. A panel of nine members, faculty, researchers and students from the Indian Institute of Technology (IIT), Delhi. They evaluated seven disposal options against environmental, health, financial and legislative criteria. The seven options included Landfill, Recycling, Incineration, Paralysis and a combination of two processes from the first three mentioned in the study. The panel weighed the criteria and scored the options on them to arrive at an overall aggregate score for the best option. The study reveals that MCDA is a very effective and transparent measure of involving and encouraging public participation in decision making with highly successful results in waste management. The panel suggested that a blend of recycling and incineration was the best option, followed by recycling and incineration. The worst approach considered by the group was open landfilling, which is a significant source of soil pollution in Delhi. According to the article, the MCDA technique for evaluating waste disposal can significantly reduce soil contamination by offering the optimum waste management option.

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