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Contents

Problems of E-Waste Management in the NCR: An Enviro-Legal Human Rights Study

VAIBHAV GOEL BHARTIYA, APEKSHA CHAUDHARY AND AFREEN ALMAS

'Vasudhaiv Kutumbakam'.The meaning of this famous Sanskrit phrase is that the whole world is one family, which is what the world is becoming. In this era of modernization and information technology, people are becoming more connected with each other. This has been made possible with the discovery of long waveradio frequency, broadband spectrums, etc. Inventions like the television, radio, mobile phones and computers have made our lives easier. We are heading towards a better quality and higher standard of life. However, we must pay the price of all this development in the form of destruction of the environment. When electronic products become obsolete,they fall under the category of e-waste,whichis a major concern for all countries at present. Man creates and moldshis environment which sustains and leads to "intellectual, social, moral and spiritual growth" (UN, 1972, p. 3). The preservation and conservation of environment is therefore necessary if humanity has to survive. Developing countries face enormous challenges related to the generation and management of e-waste which iseither internally generated or imported illegally, with India being no exception. Informal processing of electronic waste in developing countries causes serious health and pollution problem.

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1. Introduction: Human Rights and E-Waste

The term 'e-waste' itself is self-explanatory; it is an abbreviation of 'electronic waste". A key part of the definition is the word 'waste' which means any item which has no further use and is rejected as useless or excess by the owner. The term e-waste refers to all types of electrical and electronic equipment (EEE) and the parts that have been discarded by the owner as waste without the intention of re-use.

Section 3(r) of Electronic Waste Management Rules, 2016 defines the word e-waste as any electrical and electronic equipment completely or partially discarded (rejected) by the consumer or bulk consumers as well as which cannot be remanufactured, refurbished or repaired any more.

According to the **Basel Action Network,** "e-waste includes a wide and developing range of electronic appliances ranging from large household appliances, such as refrigerators, air-conditioners, cell phones, stereo systems and consumable electronic items to computers discarded by their users" (Verma & Agrawal, 2014).

The term 'human rights' means the rights which we have since birth, that is why they are also known as birthrights. Section 2 (d) of the Protection of Human Rights Act, 1993 also defines human rights as individual rights to life, liberty, equality, and dignity guaranteed by the Constitution or recognized in international covenants and enforceable by Indian courts.

Thus, 'e-waste' is extremely diverse. It varies from products across different categories. More than a thousand substances fall under hazardous 'e-waste' categories. Broadly, they consist of ferrous and non-ferrous

substances. If elements like lead, mercury, arsenic, selenium, hexavalent chromium and brominated flame retardant are present, then 'e-waste' is classified as hazardous.[1]

Sources of E-Waste

The sources of e-waste can be divided into two:

1. Formal sector includes importers, producers/ manufacturers, retailers (businesses, governments and others), consumers (individuals, households, businesses, governments), traders, and scrap dealers;
2. Informal sector includes dissemblers/dismantlers, smelters, recyclers.

There are many challenges in relation to e-waste management in India:

- Lack of awareness among manufacturers and consumers.
- Processing of maximum e-waste by the informal sector using undeveloped techniques resulting in environmental damage.
- Lack of knowledge on how to properly dispose e-waste.
- Lack of proper legislation for dealing with the problem of e-waste at present.

Objectives

This research has been carried out with the following objectives:

- To analyse the problem and perspectives of e-waste management.
- To study the effects of e-waste disposal on human rights in India.
- To find out the best method for the disposal of e-waste.
- To explore the magnitude of the e-waste problem with respect to the NCR.
- To critically examine the e-waste disposal policies and regulations in India.

Limitations of the Study

This study is a time bound study, further, the problems related to e-waste management are the same globally. Therefore, the solutions for these problems must also be similar, as must the application of human rights on every platform (whether national and international). Hence, the proposed research is limited on two major variables, the problem of e-waste and its effect on human rights and environment. The proposed study is focused on Indian enviro-legal system.

Methods of Data Collection

This research has been written using doctrinal and empirical methods of study, which involves collection of data from primary as well as secondary sources. This research on the problem of e-waste management in India is a major inquiry issue for our society. Thus, the framing of the questionnaire was an important step of the research. On the basis of the completed questionnaires received, the data was analyzed and converted into graphs. MS Excel was used to create the tables.

Characteristics of E-Waste

E-Waste has two dimensions, which are as under:

E-Waste is partly hazardous: E-Waste consists of different substances, a few of which are toxic in nature. These substances pose serious health risks and cause severe pollution in the environment due to the improper handling and disposal. That is why these substances are considered hazardous.

E-Waste is partly valuable: E-Waste also contains some valuable substance, for example, end-of-life motherboards may be sold for more than US$1,000 per ton to recyclers who recover metals (Needhidasan et al., 2014). Gold, silver and copper are some of the valuable substances in e-waste.

Basic Principles of E-Waste Management

The 4Rs, Refuse, Reduce, Reuse and Recycle are the basic principles of waste management

Refuse: The main problem of the present times is that consumers purchase unnecessary things, even those which they do not actually require, for example, two mobile phones for one person, and two or three cars in one family. Therefore, the first method is to not buy anything which is not really required.

Reduce: It is also the responsibility of everyone to reduce the amount of garbage or waste generated through electronic items. So, changes in lifestyle are required so that minimum garbage is generated.

Reuse: One must develop the habit of reuse of electronic goods to the maximum extent or till the end of the product life. Secondary use of articles is necessary and very economical as well. Reuse is the sustainable use of electronic products. A habit of reuse can make a significant contribution to saving the environment.

Recycle: 'Recycle' strategy refers to the proper and scientific end-of-life disposition of obsolete equipment. It is important to collect and sort rubbish in order to treat it and extract useful materials that can be used again. Recyclable items can be given to rag pickers or waste pickers.

"There are few things certain in life - one is death, second is change and the other is waste." No one can stop three events from taking place in our lives, we can prepare for them with proper administration or management. Here, the researchers are talking about waste-specifically e-waste management, since India is becoming a big market for e-waste.

E-Waste: Environmental Dimensions

Section 2(a) of the Environment (Protection) Act, 1986 defines the word environment as that which "includes water, air and land and the inter- relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property" (p. 268).

In *Sachidanand Pandey v. State of West Bengal (1987),* the Supreme Court held that Article 48-A should be kept in mind by the government and courts, whenever there is a problem of ecological balance. The state is under obligation to protect and improve the environment.

In *MC Mehta v. Union of India (1988),* the Supreme Court, relying on Article 48-A gave directions to the central and the state government and various local bodies and boards under the various statutes to take appropriate steps for the preservation and control of water pollution.

Types of Environmental Problems Caused due to E-Waste

Unwanted materials present in the environment cause pollution or problems. There are a number of environment problems, but we basically classify it into three categories:

- Air-related environmental problems
- Water-related environmental problems
- Soil-related environmental problems

E-Waste: Human Rights Dimensions

Environment protection is a pillar of sustainable development. E-waste management is the main concern for the present day digital world, where the use of electronic devices is increasing every day (UN News, 2017). E-waste has an adverse impact on the human rights of the individuals. Some of the human rights are as under:

- Right to access water
- Right to life
- Right to health
- Right to food
- Right to clean air
- Right to access information
- Rights of children and adults
- Worker's rights
- Occupational health diseases

Apart from various Articles of Indian Constitution and provisions in criminal law, i.e., Indian Penal Code, 1860, Criminal Procedure Code, 1973, many legislative enactments pertaining to environment and e-waste have been passed by the Indian Parliament from time to time to prevent environment pollution in the Indian society. The following are some important enactments:

- Environment Protection Act, 1986
- Public Liability Insurance Act, 1991
- Protection of Human Rights Act, 1993
- The Hazardous Waste (Management and Handling) Rules, 2003
- The Hazardous waste (Management. Handling and Transboundary Movement) Rules, 2008
- Guideline for Environmentally Sound Management of E-Waste, 2008
- National Green Tribunal Act, 2010
- The Hazardous and Other Wastes (Management, Handling and Transboundary Movement) Rules, 2016.
- E-Waste (Management) Rules, 2016
- E-Waste (Management) Amendment Rules, 2018

E-Waste Management and International Conventions

The electronics industry is one of the most important industries in the world. The use of products with either a

battery or power supply is on the rise across the world and this has become a serious threat to the world community. Every country (developed, developing, least developed) is facing problems relating to e-waste. Many international declarations and conventions have been framed for tackling the e-waste problem, such as:

1. Vienna Convention and Montreal Protocol, 1985
2. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989
3. Bamako Convention, 1991
4. Rotterdam Convention, 1998
5. Stockholm Convention, 2001
6. Nairobi Declaration on the Environmentally Sound Management of Electrical and Electronic Waste, 2006
7. Bali Declaration on Waste Management for Human Health and Livelihood, 2008
8. Minamata Convention, 2013
9. Agenda for Sustainable Development (2015) and E-Waste

The management and handling of e-waste has become the main concern for all the countries because of the harmful impact of e-waste on the environment and human health. Developing nations like India face a two-fold problem of e-waste management, firstly, the domestic generation of e-waste and secondly, the illegal import and dumping of the e-waste (Chaudhary, 2018). Thus, e-waste is not a problem of one country but a serious problem for globe.

E-Waste Management in the National Capital Region of India

Data Analysis

Primary data was collected using a questionnaire consisting of 21 closed ended and one open ended questions, analyzed and tabulated using MS Excel. Tables 1 to 21 illustrate the questions relating to e-waste.

Researchers' Observations from the Survey-1

It is evident from Table 1 that most people in the NCR (Rajasthan, Delhi, Haryana, Uttar Pradesh) are aware of e-waste. People from Delhi are more aware about the meaning of e-waste in comparison to the other states.

Conclusion: People know about e-waste and how it affects human rights and the environment.

Researchers' Observations from the Survey-2

As per Table 2, 45.57% men in the state of Uttar Pradesh take the problem of e-waste more seriously in comparison with those from Rajasthan, Haryana and Delhi. On the other hand, 48.33% women consider e-waste a serious problem.

Conclusion: Most people in these four states consider e-waste as a serious problem.

Researchers' Observations from the Survey-3

This question aimed at seeking public opinion about the disposal of e-waste which contains hazardous material. As per Table 3, 58.33% women and 49.23% of men in Delhi strongly agree on the safe disposal of hazardous e-waste.

Conclusion: Everyone is demanding for the safe disposal of e-waste.

Researchers' Observation from the Survey-4

It was found in Table 2 that most people considered e-waste as a big problem, while from Table 4, the surprising finding is that less than 40% men do not dispose of their e-waste properly. On the other hand, women are more active in disposing of their e- waste. It is the requirement of the present time to manage electronic waste in a appropriate and safe manner using sustainable technologies.

Conclusion: People consider e-waste as a problem but are not interested in its proper disposal.

Researchers' Observations from the Survey-5

Devices such as television sets, washing machines, ovens, mixers, irons and mobile phones become obsolete quickly and need to be replaced. They are handed over to kabbadiwalas (waste collectors). As per Table 5, more than 50% people consider their home as a source of e-waste.

Conclusion: People consider home as a source of e-waste.

Researchers' Observations from the Survey-6

As per Table 6, more than 50% men and women from the

NCR think that frequent changes in technology are responsible for e-waste. This table clearly shows that most people consider rapid technology advancement as a reason for e-waste.

Conclusion: Change is the need of the hour, but rapid changes in technology increase e-waste as people buy the latest electronic items and discard the unused ones.

Researchers' Observations from the Survey-7

As discussed already, the different components of e-waste, for example, mercury, iron, copper, plastic, lead oxide, barium, cadmium, beryllium, and cadmium have many adverse effects on the human body and the environment. Researchers sought public opinion on this issue. Table 7 shows that people from the NCR are aware about the ill effects of e-waste.

Conclusion: People know that e-waste has adverse effects on human rights and environment.

Researchers' Observations from the Survey-8

Children are particularly vulnerable to lead poisoning in comparison to adults, because they absorb more lead from the environment around them, which affects their nervous system and blood. E-Waste recycling activities also contribute to the elevated blood lead levels in children. Table 8 clearly shows that more than 50% people are aware of this fact.

Conclusion: People from the NCR are aware of the adverse effects of e-waste on children.

Researchers' Observations from the Survey-9

The researchers wanted to understand if people in the NCR are aware of the legislation which controls the e-waste problem in India. From Table 9, it is evident that 38.54% of the men in Haryana and 30% in Uttar Pradesh do not know of any legislation. On the other hand, 54.42% of the men in Uttar Pradesh are aware of the legislation on e-waste management.

Conclusion: The table above shows the awareness levels of the NCR, we can only imagine the awareness levels in the other states.

Researchers' Observations from the Survey-10

As per Table 10, most people from the NCR had negative opinion on the proper implementation of laws related with e-waste. People from Delhi (43.07% men and 38.33% women) disagree on the implementation of laws which is the highest in the table. Again, if people from the NCR are not satisfied, we can only imagine what people from other states think.

Conclusion: People believe that the laws framed by the governments are not implemented properly in India.

Researchers' Observations from the Survey-11

This question is clearly for those respondents who answered in the affirmative in the previous question (Table 10). In Table 11, people of Delhi (43.7% men and 38.33% women) say that the laws for e-waste management in India are not sufficient to control the problem. Men and women from the state of Uttar Pradesh are also not satisfied with the laws framed by the Government of India to tackle the problem of e-waste.

Conclusion: The majority of the respondents from the NCR are not satisfied with the laws / rules / regulations framed by the government to control the e-waste problem in India.

Researchers' Observations from the Survey-12

Section 7 of E-Waste Management Rules, 2016 makes it mandatory for the dealer to collect e-waste from customers through the 'take-back policy'. It is surprising to note that as per Table 12, the majority of the respondents are not aware of this scheme. The situation in Uttar Pradesh is really shocking in that, 63.90% of men and 61.86% of women said that they are unaware about the take-back policy.

Conclusion: This table clearly shows the poor implementation of e-waste management rules in India.

Researchers' Observations from the Survey-13

Section 7 of the E-Waste Management Rules, 2016 states that dealers must collect e-waste by from consumers through a take-back policy and refund the applicable amount as per the take back policy. Table 13 clearly indicates that people are in favour of strict implementation of the take-back policy.

Conclusion: Governments should conduct awareness programmes for the public for the proper implementation of e-waste management.

Researchers' Observations from the Survey-14

Table 14 reflects the different opinion of people from the

NCR. Firstly, men and women from Rajasthan, and men from Haryana are not ready to hand over their e-waste to e-waste collectors for free, even if assured of proper handling of e-waste and not cause environmental pollution, because of the money value attached to e-waste. On the other hand, both men and women of Delhi and Uttar Pradesh and women from Haryana are ready to give their e-waste free, if someone assured them of no environmental harm.

Conclusion: People from Delhi, Uttar Pradesh and Haryana are ready to give their e-waste to e-waste collectors free of cost, if assured of proper handling of e-waste to prevent environmental pollution.

Researchers' Observations from the Survey-15

Table 15 indicates that in spite of legislation, men and women from Rajasthan, Delhi, Haryana and Uttar Pradesh said that there is no e-waste collecting centre in their area.

Conclusion: At least two e-waste collecting centres should be opened in every district of each state.

Researchers' Observations from the Survey-16

Section 4 of the E-Waste Management Rules, 2016 says that producers are responsible for the collection and channelization of e-waste by implementing the Extended Producer Responsibility. As per Table 16, the majority of respondents, with the exception of men from Rajasthan, Haryana and Uttar Pradesh, said that producers are not responsible for the collection of e-waste.

Conclusion: Both producers and the public are responsible for e-waste collection, it is not the sole responsibility of one section of the society.

Researchers' Observations from the Survey-17

Section 7 of the E-Waste Management Rules, 2016 makes it mandatory for dealers to collect e-waste through the 'Deposit Refund Scheme'. However, the majority of the respondents are not aware about this scheme, as is evident from Table 17.

Conclusion: This table clearly indicates that there needs to be more awareness of the e-waste management rules in India.

Researchers' Observations from the Survey-18

Section 7 (2) of the E-Waste Management Rules, 2016 states that dealers shall collect e-waste from consumers through the Deposit Refund Scheme and refund the applicable amount with interest as per the refund policy. Table 18 indicates that respondents agree that this scheme will prove to be a successful tool for the collection of e- waste in India.

Conclusion: Governments should ensure that people are aware of the proper implementation of e- waste rules and policies.

Researchers' Observations from the Survey-19

Section 16 of the E-Waste Management Rules, 2016 recommends reducing the use of hazardous material in the manufacturing of electrical and electronic equipment and their components. As per Table 19, the majority of the respondents agrees on this fact.

Conclusion: People agree on the reduction of hazardous substances in the manufacturing of electronic products to control their toxicity which has a bad impact on human health.

Researchers' Observations from the Survey-20

Table 20 clearly indicates that the ratio of the men and women who said they never attended any e-waste awareness programmes is high.

Conclusion: Governments should conduct awareness programs, seminars, lectures, nukkad nataks etc. about the ill effects of e-waste as much as possible.

Researchers' Observations from the Survey-21

Finally, as per Table 21, people believe that there is a requirement for conducting awareness programs by governments, so that the environment and human health is protected.

Analysis of the Findings from the Study

E-waste, which comprises of toxic substances such as lead, mercury, cadmium, other metals and a range of several other substances, is dangerous for human health as well as the environment. In this era of rapid technological advancement, we cannot imagine life without mobile phones, refrigerators, computers, laptops, mixers, washing machines, ovens, etc. We use them indiscriminately, without analyzing the ill-effects of these products on human life. The problem of e-waste management is manmade. In India, lack of awareness about the adverse effects of e-waste on the human health and environment exacerbates

the problem. The majority of e-waste handling is done by the informal sector in India. Although we have certain environmental legislation, this problem has been increasing day by day. This research is focused on the National Capital Region of India. Before analyzing the e-waste problem, it is necessary to understand the NCR. It is a planning region centred in and around the national capital of India. It encompasses the National Capital Territory of Delhi and a number of surrounding districts in the states of Haryana, Uttar Pradesh and Rajasthan. It is one of the most densely populated and industrialised regions of the country. The following are the conclusions from the study:

1. E-waste management has a direct impact on human rights.

Finding: After review of the secondary as well as primary data, it was found that e-waste management has a direct impact on human rights such as the right to life, right to food, right to drinking water, right to clean air and right to health. The rights of children are also affected by e-waste. The effects of e-waste on human rights was analyzed in this research work. The tables above clearly show the impact of many e-waste components on human health.

2. E- Waste management rules and amendments are insufficient to address this issue.

Finding: There is no use of a law which is not properly implemented. After review of all the secondary data and on the basis of the data collected through the questionnaire, it was found that a majority of the respondents (men and women) in Delhi, Haryana, Rajasthan, and Haryana are not satisfied with the existing legal mechanism relating to e-waste management. The e-waste management rules have been amended several times by the central government but their strict implementation is required (please refer to Table 11). It was also found that local governments are not very active in implementing the e-waste management rules. People are not satisfied with the laws / rules / regulations framed by the governments to control the e-waste problem in India.

3. National Capital Region is more vulnerable in terms of environment and human rights, hence, need special attention for E-waste management.

Finding: The Delhi-National Capital Region (NCR) generates a huge amount of e-waste per annum. The factors attributed are low organized recycling, cross-border flow of waste equipment into India, limited outreach and awareness regarding disposal of e-waste, and lack of coordination between various authorities responsible, non-involvement of municipalities in e-waste management, among others. D. S. Rawat, Secretary General, ASSOCHAM said that the Delhi-NCR is turning into the world's e-waste dumping yard with the capital alone getting 85 percent of waste generated in the developed world (Bhatia, 2018). The researchers prepared a questionnaire with 21 questions, which was circulated in a sample comprising of people from the NCR. All answers show that the NCR needs special attention in terms of e-waste management because it is becoming one of the biggest hubs of e-waste.

It is clear from the discussion above that electronic waste has adverse impact on our life. Many countries need an international agreement to tackle this global challenge. Hence, there is need for an immediate action for stricter implementation of the policies and legislation on e-waste in India.

The following are some suggestions for controlling e-waste and protecting the interests of individuals:

- Governments should strictly implement the fundamental duties.
- Governments should blacklist or cancel the license of those companies who do not implement the take-back policy. Very few companies have introduced the take back policy strictly - most of the companies do not want to introduce the take back policy. For example, Xiaomi introduced a product take-back and recycling programme through which a customer's Mi account is credited with a discount of INR100 for every old product exchanged.
- Governments should identify and announce regulated e-waste dumping sites for the benefit of the general public.
- Designers should ensure that the products manufactured can be reused, repaired or upgraded. In other words, products must be manufactured for maximum use. People should be encouraged to use electronic products to the maximum possible extent, in order to reduce e-waste. Electronic products should not be rejected in the name of fashion and advancement.
- Government programmes such as the "Swachchh Bharat Abhiyan" should also focus on e-waste and its management. Other awareness programmes

(seminar, conferences, lectures, nukkad nataks, etc.) should be organized by the authorities on a regular basis to make people aware about the ill effects of e-waste.

- The Central Pollution Control Board and National Green Tribunal should take strict action against those who cause environmental pollution.
- Special training should be given to housewives regarding the safe disposal of e-waste. A list of e-waste collection centres should be prepared and circulated for public information.
- The E-Waste Management Rules, 2016 have two important policies, the take-back system and the deposit refund scheme, which should be implemented strictly and awareness about these policies should be raised by governments.
- Measures are also required to encourage investment in this sector because most people attach low status to this work. They think this work is only related to the 'kabadiwala'. Governments should make e-waste management a business and provide proper training in order to attract investment.
- Tax incentives should be given to scrap dealers, manufacturers, and individuals who contribute to the proper disposal of e-waste. Some incentives should also be given to those who are help government authorities in the collection of e-waste.
- Local and urban governments should be strictly directed for the collection and channelization of e-waste at the ground level.
- The rules and regulations for e-waste management should be strictly implemented in India.
- The concept of donating used EEE to the poor and needy children for skill development should be encouraged, mainly among schoolchildren and youth, which in turn will help in cleaning the environment.

These suggestions can prove to be very helpful for tackling the problem of e-waste management in India. In the end, it is important to understand that sustainable growth is essential for society, especially in light of the findings from this research, so that our upcoming generations can also enjoy the fundamental human rights and this green planet as well.

Endnotes:

[1] According to experts, an ordinary personal computer consists of 1.72 kg of lead. It also contains 6.8 kg of silica, 5.58 kg of iron and 6.26 kg of plastic. When we dump a computer into the soil, more than one kilograms of plastic and 1.5 kg of lead are also dumped into the soil.

Tables

Table 1: E-Waste Includes Old and Discarded TVs, Washing Machines, Mobile Phones, Laptops, Microwaves, Computers, Printers, Fax Machines, Printers, Batteries, etc.

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	39.13%	54.34%	4.34%	2.17%	0%
		Female	29.16%	54.16%	12.5%	4.16%	0%
2	Delhi	Male	49.23%	33.84%	7.49%	3.07%	6.15%
		Female	55%	36.66%	6.66%	0%	1.66%
3	Haryana	Male	35.41%	43.75%	9.37%	7.29%	4.16%
		Female	30.20%	52.08%	12.5%	2.08%	3.12%
4	Uttar Pradesh	Male	50.81%	39.01%	5.90%	0.65%	3.60%
		Female	43.19%	45.91	7.39%	1.55%	1.99

Source: Primary data collected through Google Forms

Table 2: E-Waste itself is a Big Problem

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	36.9%	26.8%	15.21 %	15.21%	6.52%
		Female	41.66%	33.33%	8.33%	12.5%	4.16%
2	Delhi	Male	43.07%	41.53%	7.69%	6.15%	1.53%
		Female	48.33%	31.66%	0%	13.33%	6.66%
3	Haryana	Male	22.91%	29.16%	26.04%	17.70%	4.16%
		Female	25%	23.95%	18.75%	23.95%	8.33%
4	Uttar Pradesh	Male	45.57%	36.39%	8.52%	6.88%	2.62%
		Female	45.13%	32.29%	15.17%	5.83%	1.55%

Source: Primary data collected through Google Forms

Table 3: Hazardous E-Wastes Need Special Treatment for Safe Disposal

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	21.73%	41.30%	13.04%	13.04%	10.86%
		Female	12.5%	58.33%	16.66%	8.33%	4.16%
2	Delhi	Male	49.23%	29.23%	13.84%	4.61%	3%
		Female	58.33%	21.66%	8.33%	10%	1.66%
3	Haryana	Male	26.04%	37.5%	18.75%	14.58%	3.12%
		Female	27.08%	35.41%	16.66%	12.5%	8.33%
4	Uttar Pradesh	Male	48.52%	38.03%	5.24%	6.22%	1.96%
		Female	52.14%	32.68%	8.17%	4.66%	2.33%

Source: Primary data collected through Google Forms

Table 4: Proper Disposal of E-Waste

S. No.	State	Gender	Yes	No	Can't Say
1	Rajasthan	Male	30.43%	41.30%	28.26%
		Female	41.66%	41.66%	16.66%
2	Delhi	Male	41.53%	36.92%	21.53%
		Female	46.66%	18.33%	35%
3	Haryana	Male	35.41%	43.75%	20.8%
		Female	31.25%	34.37%	34.37%
4	Uttar Pradesh	Male	36 %	34%	30 %
		Female	40.85%	31.24%	26.87%

Source: Primary data collected through Google Forms

Table 5: Homes are the Biggest Source of E-Waste

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	17.39%	39.13%	21.73 %	6.52%	15.21%
		Female	4.16%	54.16%	16.66%	25 %	0%
2	Delhi	Male	27.69%	43.07%	15.38%	7.69%	6.15%
		Female	26.66%	35%	16.66%	13.33%	8.33%
3	Haryana	Male	42.70%	18.75%	18.75%	12.5%	6.25%
		Female	19.35%	40.62%	16.66%	10.41%	12.5%
4	Uttar Pradesh	Male	27.54%	45.90%	11.47%	5.24%	9.83%
		Female	20.23%	54.08%	12.84%	5.44%	6.61%

Source: Primary data collected through Google Forms

Table 6: Rapid Technology Advancement as a Reason for E-Waste

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	28.6 %	43.47 %	13.04 %	8.69 %	6.52 %
		Female	25 %	41.66 %	12.5 %	16.66 %	4.16 %
2	Delhi	Male	30.76 %	36.92%	16.92 %	6.15 %	7.69 %
		Female	35 %	36.66%	15 %	8.33 %	5 %
3	Haryana	Male	23.65 %	38.70%	23.65 %	10.75 %	5.37 %
		Female	19.79 %	40.62 %	16.66 %	10.41 %	11.45 %
4	Uttar Pradesh	Male	35.08 %	43.93%	11.80 %	3.60 %	5.57 %
		Female	32.68 %	42.80 %	10.89 %	7.39 %	5.44 %

Source: Primary data collected through Google Forms

Table 7: Adverse Effect on Human Rights and Environment due to E-Waste

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	39.13 %	19.56 %	15.21 %	13.04 %	13.4 %
		Female	33.33%	29.16 %	20.83 %	12.5 %	4.16 %
2	Delhi	Male	30.76 %	38.46 %	12.30 %	12.30 %	4.61 %
		Female	35 %	38.33%	6.66 %	6.66 %	13.33 %
3	Haryana	Male	26.04 %	31.25%	18.75 %	9.37 %	13.54 %
		Female	30.20 %	28.12 %	12.5 %	22.91 %	5.20%
4	Uttar Pradesh	Male	39.01 %	39.67%	7.86 %	5.90 %	7.54%
		Female	35.01 %	42.63%	11.67 %	4.66%	5.83%

Source: Primary data collected through Google Forms

Table 8: Adverse Effects of E-Waste on Brain Development, Nervous System, IQ Levels and Behavioral Disorders in Children

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	21.73 %	36.95%	15.21 %	13.04 %	13.04 %
		Female	33.33 %	33.33 %	12.5 %	12.5 %	8.33 %
2	Delhi	Male	29.23 %	32.30 %	15.38 %	6.15 %	15.38 %
		Female	26.66 %	21.66 %	21.66 %	8.33 %	21.66 %
3	Haryana	Male	27.08 %	31.25%	20.83 %	7.29 %	12.5%
		Female	33.33%	28.12 %	15.62 %	12.5 %	10.41%
4	Uttar Pradesh	Male	33.44 %	33.77 %	13.44 %	7.54 %	11.80%
		Female	38.13%	35.79 %	12.84 %	3.89 %	8.56%

Source: Primary data collected through Google Forms

Table 9: Existence of Laws/ Rules/Regulations for E-Waste Management in India

S. No.	State	Gender	Yes	No	Can't Say
1	Rajasthan	Male	36.95 %	34.78 %	28.26 %
		Female	50 %	16.66 %	33.33 %
2	Delhi	Male	36.92 %	35.38 %	26.15 %
		Female	58.33 %	11.66 %	30 %
3	Haryana	Male	27.08 %	33.33 %	38.54 %
		Female	33.33 %	37.5 %	28.12 %
4	Uttar Pradesh	Male	54.42 %	15.40 %	30 %
		Female	50.58 %	23.34%	26.07%

Source: Primary data collected through Google Forms

Table 10: Proper Implementation of Laws/Rules/Regulations by the Government

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	10.86%	26.08%	23.91%	19.56 %	19.56%
		Female	4.46 %	25 %	29.16 %	16.66 %	25 %
2	Delhi	Male	9.23 %	16.92 %	43.07 %	23.07 %	6.15 %
		Female	16.66 %	16.66 %	38.33 %	15 %	13.33%
3	Haryana	Male	17.08 %	28.12 %	32.29 %	13.5%	8.33%
		Female	13.5 %	21.87 %	35.41 %	18.75 %	10.41%
4	Uttar Pradesh	Male	16.39 %	22.62 %	33.44 %	16.09%	11.47 %
		Female	19.06 %	22.56 %	36.57 %	9.27 %	11.28%

Source: Primary data collected through Google Forms

Table 11: Adequate Laws/Rules/Regulations for Controlling the E-Waste Problem in India

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	13.04%	34.78%	19.56%	17.39%	15.21%
		Female	12.5%	4.16%	41.66%	16.66%	25%
2	Delhi	Male	12.30%	16.92%	43.07%	16.92%	9.23%
		Female	13.33%	13.33%	38.33 %	11.66%	23.33%
3	Haryana	Male	10.41%	20.83%	31.25 %	19.79%	16.66%
		Female	13.54%	22.91%	27.08%	16.66%	18.75%
4	Uttar Pradesh	Male	8.85%	23.60%	36.72%	16.72%	14.09%
		Female	10.89%	17.89%	47.85%	15.95%	6.61%

Source: Primary data collected through Google Forms

Table 12: Knowledge About the 'Take Back Policy'

S. No.	State	Gender	Yes	No	Can't Say
1	Rajasthan	Male	8.69 %	56.52 %	34.78 %
		Female	45.83 %	33.33 %	20.83 %
2	Delhi	Male	16.92 %	64.61 %	16.92 %
		Female	15 %	41.66 %	43.33 %
3	Haryana	Male	27.08 %	51.04 %	20.83 %
		Female	25 %	41.66 %	32.29 %
4	Uttar Pradesh	Male	16.72 %	63.90 %	19.67 %
		Female	18.28 %	61.86 %	18.67 %

Source: Primary data collected through Google Forms

Table 13: Strict Implementation of the 'Take Back Policy' for Purchasing New Electronic Products

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	26.08 %	39.13 %	13.04 %	8.69 %	13.04 %
		Female	12.5 %	37.5 %	25 %	16.66 %	8.33 %
2	Delhi	Male	40 %	33.84 %	12.30 %	9.23 %	3.07 %
		Female	21.66 %	35 %	15 %	05 %	23.33 %
3	Haryana	Male	14.58 %	35.41 %	22.91 %	16.66 %	9.37 %
		Female	12.5 %	28.12 %	29.16 %	17.70 %	11.45%
4	Uttar Pradesh	Male	36.06%	40.32 %	8.19 %	5.57 %	9.83%
		Female	32.68 %	42.41 %	7.78 %	6.22 %	10.11%

Source: Primary data collected through Google Forms

Table 14: Readiness for Giving E-Waste for Free on Assurance of Proper Handling of the Waste

S. No.	State	Gender	Yes	No	Can't Say
1	Rajasthan	Male	30.43%	41.30 %	28.26 %
		Female	36.5 %	38.8 %	25 %
2	Delhi	Male	69.23 %	16.92 %	12.30 %
		Female	66.66 %	15 %	18.33 %
3	Haryana	Male	38.54 %	41.66 %	18.75 %
		Female	38.54 %	27.08 %	33.33 %
4	Uttar Pradesh	Male	66.25 %	18.03%	15.63%
		Female	63.81%	17.89 %	17.12%

Source: Primary data collected through Google Forms

Table 15: E-Waste Collecting Centres in your Vicinity

S. No.	State	Gender	Yes	No	Can't Say
1	Rajasthan	Male	10.86 %	52.17 %	36.95 %
		Female	8.33 %	66.66 %	25 %
2	Delhi	Male	10.76%	52.30 %	35.38%
		Female	16.66 %	56.66 %	26.66%
3	Haryana	Male	15.62 %	58.33 %	25 %
		Female	16.66 %	48.95 %	33.33%
4	Uttar Pradesh	Male	18.36 %	57.04 %	24.59%
		Female	14.78%	52.14 %	31.90%

Source: Primary data collected through Google Forms

Table 16: Sole Responsibility of Producers for the Collection of E-Waste

S. No.	State	Gender	Yes	No	Can't Say
1	Rajasthan	Male	41.30 %	36.95 %	21.73 %
		Female	33.33 %	41.66 %	25 %
2	Delhi	Male	33.84 %	41.53 %	23.07%
		Female	25 %	48.33 %	26.66 %
3	Haryana	Male	37.5 %	36.45%	25 %
		Female	49.50 %	35.08 %	15.40%
4	Uttar Pradesh	Male	49.50 %	35.08 %	15.40 %
		Female	35.96 %	37.96 %	16.22 %

Source: Primary data collected through Google Forms

Table 17: Knowledge about the 'Deposit Refund Scheme'

S. No.	State	Gender	Yes	No	Can't Say
1	Rajasthan	Male	19.56 %	43.47 %	36.95 %
		Female	4.16 %	75 %	20.83 %
2	Delhi	Male	10.76 %	64.61%	23.07%
		Female	13.75%	50 %	36.66%
3	Haryana	Male	15.62%	55.20%	28.12%
		Female	15.62 %	55.20%	28.12%
4	Uttar Pradesh	Male	20.65 %	58.03 %	21.31 %
		Female	24.51%	49.41 %	27.23%

Source: Primary data collected through Google Forms

Table 18: 'Deposit Refund Scheme' as a Successful Tool for Collection of E-Waste in India

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	4.34 %	32.60	21.73%	17.39%	23.92%
		Female	12.5 %	25 %	12.5%	12.5 %	37.5 %
2	Delhi	Male	29.23 %	33.84 %	13.84 %	4.61 %	18.20 %
		Female	11.66 %	41.66 %	13.33 %	5 %	28.33 %
3	Haryana	Male	10.41 %	42.70 %	17.70 %	14.58 %	13.54 %
		Female	13.54 %	27.08 %	23.95 %	18.70 %	16.66%
4	Uttar Pradesh	Male	23.27%	43.60 %	9.83 %	5.90 %	17.37%
		Female	18.28 %	48.63 %	9.33 %	5.44 %	17.50%

Source: Primary data collected through Google Forms

Table 19: Reduction of Hazardous Substances in the Manufacturing Stage is a Good Option for Controlling the Toxicity of Electronic Products

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	4.34 %	32.60	21.73%	17.39%	23.92%
		Female	12.5 %	25 %	12.5%	12.5 %	37.5 %
2	Delhi	Male	29.23 %	33.84 %	13.84 %	4.61 %	18.20 %
		Female	11.66 %	41.66 %	13.33 %	5 %	28.33 %
3	Haryana	Male	10.41 %	42.70 %	17.70 %	14.58 %	13.54 %
		Female	13.54 %	27.08 %	23.95 %	18.70 %	16.66%
4	Uttar Pradesh	Male	23.27%	43.60 %	9.83 %	5.90 %	17.37%
		Female	18.28 %	48.63 %	9.33 %	5.44 %	17.50%

Source: Primary data collected through Google Forms

Table 20: Attended or Joined E-Waste Awareness Programmes

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	17.39 %	21.73 %	**34.78%**	15.21%	10.86%
		Female	8.33 %	20.83%	**50 %**	16.66 %	4.16%
2	Delhi	Male	10.76 %	26.15%	**36.92%**	15.38%	9.23%
		Female	6.66%	26.66%	**33.33 %**	16.66%	16.66%
3	Haryana	Male	13.54%	15.62%	**44.79 %**	11.45%	13.54%
		Female	11.45%	23.95%	**38.54%**	12.5 %	12.5%
4	Uttar Pradesh	Male	13.44%	25.57%	**37.04%**	13.77%	10.61%
		Female	11.67%	20.23%	**40.46%**	13.22%	13.61%

Source: Primary data collected through Google Forms

Table 21: Organisation of More E-Waste Awareness Programmes by Governments

S. No.	State	Gender	Strongly Agree	Agree	Disagree	Strongly Disagree	Can't Say
1	Rajasthan	Male	23.91%	**34.78%**	23.91%	8.69 %	8.69%
		Female	16.66%	**41.66%**	20.83%	16.66%	4.16%
2	Delhi	Male	50.76%	**26.15%**	9.23 %	1.53%	4.16%
		Female	10%	**40%**	3.12 %	36.66%	10.66%
3	Haryana	Male	25 %	**43.75%**	16.66 %	6.25%	7.29%
		Female	16.66%	**25.12 %**	20.83 %	19.79%	13.54%
4	Uttar Pradesh	Male	38.36%	**39.34%**	9.83%	7.54%	4.91 %
		Female	46.04 %	**44.65 %**	10.69 %	10.23%	6.97%

Source: Primary data collected through Google Forms

References

Bhatia, A. (January 11, 2018). E-Waste on Continuous Rise in Delhi-NCR, by 2020 it is Likely to Generate 1.50 Lakh Metric Tonnes of Waste, Says Assocham Report. NDTV. https://swachhindia.ndtv.com/e-waste-continuous-rise-delhi-ncr-2020-likely-generate-1-50-lakh-metric-tonnes-waste-says-assocham-report-16553/ (Last visited on July 29, 2022)

Chaudhary, N. (2018). Electronic waste in India: A study of penal issues. *ILI Law Review,* Vol. II.

M.C. Mehta v. Union of India. (1988). 1 SCC 471.

Ministry of Environment, Forest and Climate Change, Government of India. (2016). Electronic Waste (Management Rules), 2016. https://cpcb.nic.in/displaypdf.php?id=RS1XYXN0ZS9FLVdhc3RlTV9 SdWxlc18yMDE2LnBkZg==

Needhidasan, S., Samuel, M., & Chidambaram, R. (2014). Electronic waste – an emerging threat to the environment of urban India. *Journal of Environmental Health Science and Engineering,* 12(1), 36. doi:10.1186/2052-336x-12-36.

Protection of Human Rights Act, (1993). https://www.mha.gov.in/sites/default/files/Protection%20of%20HR%20Act1993_0.pd fSachidanand Pandey v. State of West Bengal, AIR 1987 SC 1109

The Environment (Protection) Act, (1986). https://www.indiacode.nic.in/bitstream/123456789/4316/1/ep_act_ 1986.pdf

United Nations. (1972). Report on the United Nations Conference on the Human Environment. https://documents-dds-ny.un.org/doc/UNDOC/GEN/NL7/300/05/IMG/NL730005.pdf?OpenElement

UN News. (December 13, 2017). Electronic waste poses 'growing risk' to environment, human health, UN report warns. United Nations. https://news.un.org/en/story/2017/12/639312

Verma, D.S., & Agrawal, S. (2014). E-waste management in India: Problems and Legislations. International Journal of Science, *Engineering and Technology Research (IJSETR),* Volume 3, Issue 7.

"I only feel angry when I see waste. When I see people throwing away things we could use."

– Mother Teresa

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