

INTERNATIONAL JOURNAL OF LAW MANAGEMENT & HUMANITIES

[ISSN 2581-5369]

Volume 6 | Issue 3

2023

© 2023 *International Journal of Law Management & Humanities*

Follow this and additional works at: <https://www.ijlmh.com/>

Under the aegis of VidhiAagaz – Inking Your Brain (<https://www.vidhiaagaz.com/>)

This article is brought to you for “free” and “open access” by the International Journal of Law Management & Humanities at VidhiAagaz. It has been accepted for inclusion in the International Journal of Law Management & Humanities after due review.

In case of **any suggestions or complaints**, kindly contact Gyan@vidhiaagaz.com.

To submit your Manuscript for Publication in the **International Journal of Law Management & Humanities**, kindly email your Manuscript to submission@ijlmh.com.

Processing and Degrading Simultaneously: E-Waste an Explanatory Study Needs a Compelling Clustering Statute

PRANALI¹ AND RISHIKA RANI²

ABSTRACT

Decorating environment is a prime concern now a days. Pollution level is increased to that extent where its management seems to nearly impossible. The E-waste or electronic waste is one of the main contributors to the environmental pollution. E-waste are those electronic devices which are discarded and are not in use. But the management of e-waste in informal process causes in pollution problems and ultimately in serious health issues. Components of electronic scrap like CRTs (Cathode Ray Tubes) may consist of contaminants such as brominated flame retardants, cadmium, lead, beryllium. Around 50 million tons of E-wastes are produced annually. This depicts the possible and dangerous threats to natural environment and its habitants, if it is not checked and not properly disposed depending upon its hazardous and toxic nature of reaction towards air, land and water. This paper discusses the pros and cons of E-waste and possibly each and every aspect regarding E-waste and its management as well as its legal aspects too.

Keywords: *Electronic waste, Environmental pollution, Hazardous and toxic, Public health, E-waste management.*

I. INTRODUCTION

Human beings are considered as “Sarvashreshtha Prani” literal meaning is “supreme creature” according to our Vedas and Puranas among all the creatures of this world. We have given the supreme power of intellect which helps us to differentiate between good or bad and right or wrong. But in greed we only think of good and profitable things for us and contribute every ounce of our intellect and energy in achieving it. In order to chasing and achieving our greed, we neglect our mother nature, our environment and done nothing but have degraded and destroyed it to that extent where now we just achieving wrath of nature. But in this outbreak of COVID-19, nature is rejuvenating itself as the researchers presented the data about reduction of pollution level from atmosphere, biosphere, and hydrosphere. Meanwhile, the threat due to

¹ Author is a student at Banasthali Vidyapith, India.

² Author is a student at Banasthali Vidyapith, India.

electronic industry is still there. Electronic industry being the largest and innovative industry, it brings more challenges day by day. Export and import of electronic devices can be measured in tons even year. In this developing situation every other day new and enhanced models of electronic devices are launched and software are getting better and better, which only runs in new and enhanced ones. This leads to the old electronic items appear as garbage to its users. Everybody wants be updated and are in seek of opportunity how to keep up with new technologies. In this way they discarded the old ones and those discarded items are called E-wastes. Near about 75% of e-wastes are uncertain in order to find ways and process to make them reuse full, including remanufacture or refurbishment or use its parts for other minor uses. People also dumped it in garbage along with other wastes. Then the scrape collectors for the purpose of hunting valuable metals such as platinum, cadmium, gold etc. burnt the circuits. This liberates hazardous smoke and carbon particles as the cable wires are made of PVC³ and PCB⁴ and these gases are toxic which causes lung and skin cancer etc.

(A) Research Methodology

This very paper follows a secondary research on aspects regarding environmental and health effects due to E-wastes. Data have been collected from miscellaneous websites, research papers, news articles, government and NGOs reports.

(B) Scope of the paper

The aim of this paper is to highpoint about the electronic waste, legislation involved and its effect on human beings. The appropriate legislation is there but progress is still on minced nil.

(C) Literature Review

Electronic waste also termed as E-waste is defined as “*an electrical and electronic equipment, whole or in part discarded as waste by the consumer or bulk consumer as well as rejects from manufacturing, refurbishment and repair processes*”⁵. In a general way E-waste can be defined as discarded mobile phones, refrigerators, computers, entertainment electronic devices, office electronic equipment, etc. and such electronic items are destined for reuse, recycle, resale or disposal.

In 2015 India had generated about 1.5 Million tons and in 2017, 2 Million tons of E-wastes were generated; and acquired the fifth position among E-waste generating nations like United States, China, Japan and Germany. But recycled only 0.037 Million tons of E-waste in year 2016-2017.

³ Polyvinyl chloride.

⁴ Polychlorinated biphenyls.

⁵ Section 3(r) of E-Waste (Management) Rules, 2016.

In 2018, three countries were accounted for contributing for almost about 38% in generating of E-waste. China had acquired the first position for biggest contributor with 10.1 Million tons of E-waste followed by United States which contributes about 6.9 Million tons and India was third biggest contributor with 3.2 Million tons of E-wastes. But only 17.4% of E-waste was recycled which was produced in year 2018. In 2019, E-waste was generated almost about 53.6 Million Metric tons, which was a record and according to the UN's Global E-waste Monitor, 2020 it was found that in mere 5 years E-waste was hike up to 21%. In 2019, the massive volume of 24.9 Million tons of E-waste was generated by Asia only followed by United States with 13.8 Million tons and Europe contributed about 12 Million tons. By 2030, it has been estimated that the amount of E-waste will hike up to 74 Million tons almost doubling of the E-waste in mere 16 years, in which personal appliances contribute about half of E-waste like smartphones, screens, PCs, tablets and TVs with the rest being major household appliances along with cooling and heating equipment.

If only talk in context of Indian Maharashtra contributes about 19.8% but recycles merely 47,810 tons annually, Tamil Nadu with 13% and merely recycles 52.427 tons annually, Uttar Pradesh with 10.1% and recycles about 86,130 tons annually, West Bengal contributes 9.8%, Delhi is with 9.5%, Karnataka with 8.9%, Gujarat with 8.8% and Madhya Pradesh with 7.6% but recycling is done which is approximately 1-2% of E-wastes generated.

In India industrial sector, household, commercial establishments, government sector etc. are the main sources of E-waste. Household contributions are TVs, radio PCs, fan, cell phone, charge, chargers, washing machine, CDs, CD-players, i-pods, AC, electric iron, microwave oven, electronic toys, refrigerators etc. Hospital contributes as monitors, ECG device, microscope, incubator etc. By government sector contribution are like CPU, calculator, tube light, Xerox machine, fax machine, scanner, etc. and boiler, signal generator, mixer etc. are from public sector.

On the basis of size and nature E-wastes are of different types such as- 1. Major appliances including washing machine, dryers, refrigerator etc. 2. Minor appliances include irons, vacuum cleaner fryers, blenders etc. 3. Lighting device such as fluorescent tubes, incandescent light bulbs, gas discharge lamp, etc. 4. Consumer electronics appliances like musical instruments, audio- video equipment. 5. Toys and leisure appliances includes models, sports items, electronic toys. 6. Vending machine. 7. Computer and telecommunication appliances includes laptops, PCs, mobile phone, telephone. 8. Electrical and electronics tools like saws, drills, gardening device. 9. Monitoring appliances such as laboratory equipment, thermostats, detectors. 10. Medical appliances includes all medical equipment and devices but implants are considered as

exception.

E-wastes consists of or are made up of- 1. Electronic components 2. Nonferrous metals especially aluminium and copper for cables. 3. Glass used for windows and screens. 4. Plastic and PVCs as casing for circuits boards and in cables. 5. Other materials such as ceramic, rubber, wood, polyester etc.

On the basis of toxicity: Electronic goods are classified utmost under three majors which are namely White goods⁶, Brown goods⁷ and Grey goods⁸. Wastes that included grey goods are highly toxic than with the white and brown goods. This sort of wastes is propounding a serious threat and challenges in order for recycling as well as disposal not only in developing countries like India but also in developed countries like United States.

As for instance, a computer consists of different types of elements which includes valuable metals such as copper, silver, platinum, gold etc. as well as materials of hazardous nature such as lead, lithium, mercury, cadmium, nickel, brominated flame retardants, cobalt, arsenic, selenium, polychlorinated biphenyls, barium, chrome also. Apart from all these it also consists of sophisticated blend of plastic and carbonization of these waste materials leads to the liberation of toxic gases like dioxins and furans.

Many international treaties like Basel Convention⁹ set sights on reducing and synchronizing the drift of hazardous waste between the countries. Even after the pact, shipments and dumping are continue to crop up illegally. E-waste disposal is alike hitch confronted encircled the globe. Problems of soil acidification rises up when E-wastes disposed on the ground and if E-wastes are used as landfills ground water gets polluted as its contaminated leachates which eventually effects health of human beings and nature also.

Following are the hazardous effects on environment due to composition of E-wastes-

1. Materials like barium, chromium, flame retardants, lead, nickel are the compositions of most electronic of that are toxic in nature and its release into environment are hazardous for human body and health such as CNS, PNS, organs like kidneys and blood as well.
2. Toxic chemicals are released when these E-wastes are heated up or when burned into the air results in foul air in the atmosphere, is the biggest impact.
3. When these E-wastes are dumped away in landfills, the toxic chemicals from these

⁶ All household used appliances

⁷ Cameras, TVs, Camcorders

⁸ Fax machine, computers, scanners, printers

⁹ Basel Convention on the Control of Trans-frontier Movements of all kinds of wastes which are of hazardous nature and its Disposal, adopted in 1989 but enter into force in 1992.

wastes get absorbed by the soil and leaches into groundwater further affecting land and marine animals as well.

Following are the hazardous effects on human due to composition of E-wastes-

1. Front panel of CRTs¹⁰ constitute of Barium which causes damage to liver, heart and spleen and also weakens the muscles.
2. Solder in in printed circuit boards, gaskets and glass panels in computer monitors contains Lead which damages kidney, blood circulation system and central and peripheral nervous system. Also affects the brain development in children.
3. Printed circuit boards, switches and relays are made of Mercury causes chronic damages to the respiratory system, brain and skin disorders due to bioaccumulation in aquatic animals especially in fishes.
4. Computer housing and cabling are made up of plastic and PVCs and on burning it liberates dioxin which causes damage to immunity system, reproductive and development problems accompanied with intrusion with regulatory hormones.
5. Semiconductors and chip resistors contain Cadmium which when accumulates in kidney and liver causes neural damage, abnormalities in physical growth and development and the toxicity made irreversible effects to human health.
6. Motherboards constitute Beryllium which is carcinogenic¹¹ causes CBD¹² or berylliosis and warts¹³.
7. Plastic housing of circuit boards and electronic equipment have Brominated flame retardants which retards the functions of endocrine system.
8. Corrosion protection of galvanized and untreated steel plates and decorators constitute Hexavalent chromium VI causes DNA damage and asthmatic bronchitis.
9. Lithium-ion battery contains Lithium which when passes into breast milk and might harm a nursing infant.
10. Nickel Cadmium rechargeable battery contains Nickel which causes dermatitis as it causes allergy to skin and causes asthma due to allergy in lungs.
11. Printed circuit boards and copper wire made up of Copper which results in nausea,

¹⁰ Cathode Ray Tubes

¹¹ Lung cancer

¹² Chronic Beryllium Diseases

¹³ Type of Skin disease

stomach cramps and lung damage (Wilson's disease).

But every waste has some recyclable materials in them and so as E-wastes which includes metals, plastic and glass. If these E-wastes are dismantled, dumped or disposed properly which is not yet in practice due to lack of knowledge and awareness among workers; instead, these E-wastes are just dealt in crude way like they are carbonized or use of chemicals to melt them and other improper disposal methods are adopted which causes only wreak havoc nothing less. For instance, Seelampur of Delhi is considered as dismantling core of India as which is managed by unorganised sector and in informal manner. The formal sectors, less in count charges a little fortune for the process of recycling E-wastes, hence results in all the issues as 95 % of recycling is done by informal sectors.

II. E-WASTE AND LEGISLATION

In 2011, laws regarding E-waste management have been formulated in India, titled as "E-waste (Management and Handling) Rules, 2011". The key features of this rule are as follows-

- Applicable to producers, bulk- consumers, consumers, collection centre, dismantlers and recyclers to EEE¹⁴ as mentioned in Schedule- I.
- Exemption is for both micro and small industries segment as mentioned in Micro Small and Medium Development Act, 2006.
- Collection centres shall be set up by producers or as has been authorised for collection E-waste E-wastes and also SPCBs has set separate authorization to set up collection centres.
- SPCBs¹⁵/ PCCs¹⁶ are responsible to provide authorisation to producers for their EPR so that channelization of E-waste shall be effective only by registered dismantler or recyclers.
- Permission for authorised collection centres dismantlers and recyclers shall be done separately and all the States provide separate authorization for EPR.
- Bulk consumers particularly as Central Government or State Government, public sector, banks, educational institutions, multinational organization, international damages etc. are obligated to get registered under the Companies Act, 2013¹⁷ and the Factories Act,

¹⁴ Electric and electronic equipment

¹⁵ State Pollution Control Board

¹⁶ Police Clearance Certificate

¹⁷ 18 of 2013

1948¹⁸.

- Instructions to reduce hazardous substances like hexavalent chromium, mercury, cadmium, lead, polybrominated biphenyls and polybrominated diphenyl ether, shall not comprise over an utmost concentration of 0.1% by weight in homogeneous materials for hexavalent chromium, mercury, lead, polybrominated diphenyl and polychlorinated diphenyl; and 0.01% by weight in homogeneous materials for cadmium.

But the demanding situation lead to formulation of new and improved rules regarding E-waste.

(A) Loopholes of E-waste (Management and Handling) Rules, 2011:

As the rules of 2011, lacked certain concerning points that was the need of hour such as-

- Target based approach for collection under EPR
- Economic instrument for implementation of rules
- Exchange of E-wastes.
- Manufacturer's responsibilities.
- Dealer's responsibilities.
- Refurbisher responsibilities.
- Responsibilities of Government.
- Transportation of E-wastes.
- Provisions for liabilities.
- Responsibilities of urban local bodies.

These lacunas were dealt in rules in 2016 and an enhanced rule titled as "E-waste (Management) Rules, 2016" was enacted on 1st October, 2017. The commission tried to fill all the loopholes of previous rules of 2011 and the salient features of this is given as-

- Application of this rule is extended to manufacture, dealers, refurbisher and PRO¹⁹ to check leakages of E-waste to informal sectors during channelization period and expanded to components, consumables spares and parts of EEE listed in Schedule-I. Also, CFL²⁰ and lamps which contains mercury, is taken under this ambit of this rules.
- Immunity remains for micro enterprises, nevertheless small industries sector, which

¹⁸ 63 of 1948

¹⁹ Producer Responsibility

²⁰ Compact Fluorescent lamp

have been stated as one of the key sources of E-wastes production, have been counted in in the rules and manufacturers but EPR responsibility is excused as it is applicable for producers only.

- EPR authorisation has been replaced by single EPR Authorisation for producers under CPCB's²¹ responsibility
- This rule is added and reads as E-waste collection channelization in EPR- Authorization shall prevail in with the marks prescribed in Schedule-III of guidelines. The phase wise compilation Target for E-waste, which can be either in quantity or bulk shall be 30% of the quantity of wastes generation as indicated in EPR plan during first two years of implementation of rules followed by 40% during third and fourth years, 50% during fifth and sixth years and 70% during seventh year onwards.
- Permission for authorised collection centres, dismantlers and recyclers now is not necessary to be done separately in order to avoid delays.
- Introduction of Deposit Refund Scheme as economic instrument wherein at the period of rummage sale of electrical and electronic appliances, an additional amount is being charged by producers as a deposit and is returned back to consumers when the electrical and electronic equipment is returned at the end-of-life along with interests.
- An action of E-waste exchange is provided in the rules in which end-of-life electrical and electronic equipment can be sale and purchased.
- To check leakages of E-waste to informal sectors, manufacturers is now responsible of collection.
- To provide flexibility to producers and dealer has been given responsibilities of collection and it is done by providing the consumer a box in order to collect E-waste. Under the take back system and Deposit Refund Scheme of producer, dealer, retailer or E- retailer has been refund the amount to the E-waste depositor.
- Again, to check leakages to informal sectors, it is responsibility of refurbisher to collect the E-waste throughout the process of restoring and channelization it to an authorised dismantler/retailer through its compilation centres and search for one-time approval from SPCB.
- To bring clarity to definition and to put obligation on bulk consumers who are the major

²¹ Central Pollution Control Board, 1974

generator of E-waste and health care facilities which have the turnover of more than 1 crore or employees exceeds from twenty. Also, annual returns are now needed to be filled by bulk consumers.

- Introduction of State Governmental role suggests to ensure health, safety and workers' skill development need for dismantling and recycling process. Also State Government has to prepare integrated plan for effective implementation of this provision and annual report of this shall be submitted to Ministry of Environment, Forest and Climate Change.
- RoHS²² has been thru explicit RoHS and associated Schedule-II has been reviewed and modified in line with prevailing EO governing framework in which the provision is based and if the products not comply with RoHS provision, corrective measures shall be taken to bring the products into compliance.
- E-waste transportation shall be carried out according to the manifest system, in which it is expected to convey a document (three copies) formulated by the correspondent with the transporter in order to avoid accidental flux during carriage to informal sectors.
- Due to improper management of E-wastes, slightly devastations inflicted to the environment or the third-party obligation will be ascended as well as provision for imposing financial penalty for violating of provision of the rules has been included.
- The duty to collect and channelize the orphan E-wastes to authorised dismantler/recycler has been assigned to urban local bodies such as Municipal corporation/committee/council.

The rest of the loopholes have been checked in E-waste (Management) Amendment Rules, 2018 which be situated as follows-

- The establishment concerning extensive producers' accountability have been reviewed and how the stage wise E-waste assortment shall be 10% of the amount of the waste production with 10% of increment every year till 2030.
- Rules regarding E-waste collection targets for new producers has been included.
- Provisions of RoHs has been revised, now if products are according to the guidelines mentioned under the RoHS then government shall bore the expanse of sampling and testing, and if does not accomplish then the expense of test will be accepted and carried by the producers.

²² Reduction of Hazardous Substances

So, all the responsibilities, liabilities, way of conduction of matters related to E-waste has been tried to cover up by all the provision and revised provisions given in Rules of 2016 and 2018. The statue related to e-waste its management and disposal was the need of the hour as every aspect has its two sides generation of E-products are the sign of development and on the other hand mismanagement led to concern for health as well as for the environment. The rules are quite efficient to tackle the situation but there is need for some check bodies to confirm the same. Because the production of E-waste is growing day by day at exponential rate.

Many companies according to the take back policy in India like Microsoft, Apple, Philips, Sony, Panasonic, Toshiba etc. has complied to an extent. WIPRO and HCL are two brands having the best practice in India. Also, Motorola, Nokia and Acer have done relatively good job in this direction.

III. HOW COULD WE ABLE TO REDUCE E-WASTE?

Reduction in E-waste is a thought-provoking procedure and it requires us to pledge that it is our obligation to make sure that what we want and able to use it properly and how to dispose it when it can never be used in any way. We have to follow an appropriate tactics to reduce the amount of E-waste.

The following could be

- We all know that knowledge is power. We should educate ourselves about the electronic gadgets like what raw materials have been used and whether it is recyclable or not. This leads us where we only by electronic gadgets which are least harmful for the environment.
- We should be a responsible and good consumer. When to buy new products, one should do some research about the product and compare the options available and buy the electronics only then. The key point to have in mind is that buy that product one which have a longer lifespan. In this we can save our hard earn money as one not often has to buy these expensive electronic gadgets frequently.
- We should reuse every so often possible. If any one part of the gadget is at fault, then try to repair.
- We should recycle those gadgets which are beyond restoration.
- We should always look for gadgets which have been certified by the Eleareaic Product Environmental Assessment Tool.

- We should be aware of the young generations about the electronic gadgets they use because they always want to be made what is trending. In Took cool or not likely be inferior among their peers they tend to have to have the new electronic gadgets in the markets. And educate them about things not make them cool or superior but the thoughts and ideas.
- Government should make collection centers in every centered urban area.
- The number of recycling and dismantling centers should be increased in every state to enhance effective e-waste recycling and management.
- The individuals must be make aware to encourage separation at the generation centers.

IV. CONCLUSION

Like every coin has two faces, just like that every element that prevails in this environment has also exhibit two nature that is positive and negative. It is great that our country is developing pretty well towards developed electrical and electronic equipment; but the negative side is that E-wastes are generating at a large extent. In this 21st century the technology is booming and will bring more and more challenges ahead. Thus, our preparedness should be endowed with new technologies, infrastructure and apprehension for E-waste treatment. A great challenge for the government is the management of E-waste in many developed as well as developing countries like India. It is becoming a great threat to immense Public health issues and is increasing exponentially day by day. In order of priority of collection, effectively treating and disposing of E-waste separately as well as to avert it from conventional land fillings and carbonization in open. The proficient authorities in developing and transition countries need to institute mechanism for handling and treatment of E-waste in a safe and sustainable manner. For the reduction of environmental loading 5Rs postulates should be followed in the country. The government should also shift their attention towards the problem of illegal dumping. Basel Convention is there but it is not that effective. More strict and effective acts ought to have made. And government should also use this electrical and electronic equipment to promote all the Rules, Acts and Conventions made for scrutinization of E-waste. Government should use internet platform as every age group of people spend a good amount of time surfing there. Government should make people aware of the hazardous effects of E-waste and all the guidelines regarding dumping and disposing. As all people are not aware of all the laws so government should collaborate with those who are active as professional at internet sites like Facebook, Instagram, Twitter etc. to spread awareness about these things and at the same time government will be providing employment to those people. NGOs should also contribute

towards it by conferences, dramas etc. Then we will be able to make our environment free of E-wastes and our stakeholders will also be able to enjoy this environment as well as this more improved technology.

V. REFERENCES**(A) Authored Books**

- Shankar IAS academy, ENVIRONMENT SHANKAR IAS ACADEMY BOOK PUBLICATIONS (6th Revised Edition, September 2018).
- Gurdip Singh, Amrita Bahri, Environmental Law (EBC, Lucknow, 2nd edn.2016).
- Dr.S.C. Tripathi, Mrs. Vibha Arora, Environmental Law (Central Law Publication, Prayagraj, 7th edn.2019).
- Dr. Paramjit S. Jaswal, Dr. Nistha Jaswal, Environmental Law (Allahabad Law Agency, Faridabad, edn.2021).

(B) Article/ Essay

- Deepak Kumar Adhana “E-Waste Management in India: A Study of Current Scenario” Volume IX, Issue I, IJMT&J Jan/2019.
- Sharif Mohd. &Vijay Kumar Kaushal “Waste Management in India Current Practices and Challenges “Volume, Research Gate ,2018.
- Anwasha Borthakur, Pardeep Singh, “Electronic waste in India: Problem and Policies”, International Journal of Environment Science, Volume 3, 2012, pp 354-362.
- Deepali Sinha-Khetriwal, P. K. “A comparison of electronic waste recycling in Switzerland and in India. Environment Impact Assessment Review” 25, 492-504,2005
- Kumar Rajesh, (2016). Current Scenario of e-waste management in India: issues and strategies. International Journal of Scientific and Research Publications, Volume 6, Issue 1, January 2016 430 ISSN 2250-3153.
- E. Yoheeswaran” E-Waste Management in India” Volume: 2 | Issue: 4 | IGRA April 2013 • ISSN No 2277 – 8160.
- Aditya Vijayvargiya, Mr. Kapil Sahu” A Review Paper on “E-Waste” Technology” Issue: V-IMPACT – 2016 (Volume 4 – Issue 32), IJERT,2018.
- Lynda Andeobu, Santoso WibowoORCID &Srimannarayana Grandhi “A Systematic Review of E-Waste Generation and Environmental Management of Asia Pacific Countries”, Volm.18, Issue.17, IJEPRH, 2021.
- Gupta Reena, Sangita and Kaur Verinder” Electronic Waste: A Case Study” Vol. 1(9), RJCS,2011.

- M. Khurram S. Bhutta, Adnan Omar’’Electronic Waste: A Growing Concern in Today's Environment’’, Volume 2011, Hindawi, ERI,2011.
- Sivakumaran Sivaramanan “E-Waste Management, Disposal and Its Impacts on the Environment’’, Volume 3, Issue 5: 531-537, ujert, 2013.
- Introduction to Environmental law in India. available at <http://www.legalserviceindia.com/legal/article-635-introduction-to-environmentallaw-in-india.html>.
- Report on “E-waste in India”, Research Unit (LARRDIS), Rajya Sabha Secretariat, New Delhi, June 2011, rejasabha.nic.in.
- Harshini Vakkalanka’’ The A-Z of e-waste management’’ The Hindu June ,19,2018.
