

E-WASTE: THE GLOBAL CONCERN

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As we know that the coin has two sides- positive and negative, similarly technologies also lay down certain pros and cons. After the Industrial Revolution, it opens a new era of development. People have started adapting to the advancing of technology. And such advancing arose the problem of e-waste. Both developed countries and the developing are suffering from the e-waste problem. Due to the advancement of technology, the lifespan of the product is also getting shorter, for example- The demand of Samsung mobile phone has been growing exponentially and we can see in every 6 months the company introduce a new and advanced model of electronic gadget in order to survive in the competition. E-waste is a major problem, as not only it affects the environment, but also affects the health of the human beings and the government as well as the international agency should come together under one roof and try to make a stricter policy. The purpose of the paper is to delineate the e-waste problems and provide an estimated amount of e-waste produced, consequences, measures and techniques used by the countries in order to control the e-waste.

INTRODUCTION

Electronic waste, or e-waste, refers to computers, mobile phones and other devices after users have thrown them away. Electronic waste or e-waste is one of the rapidly growing problems of the world. To some e-waste is an environmental scourge to be battled. To others, it is an opportunity to enhance economic development. E-waste comprises of a multitude of components, some containing toxic substances that can have an adverse impact on human health and the environment if not handled properly.¹ Over the past two decades, the global market of electrical and electronic equipment (EEE) continues to grow exponentially, while the lifespan of those products becomes shorter and shorter. Therefore, business as well as waste management officials is facing a new challenge, and e-Waste or waste electrical and electronic equipment (WEEE) is receiving a considerable amount of attention from policy makers. Predictably, the number of electrical devices will continue to increase on the global scale, and microprocessors will be used in ever-increasing numbers

¹ Eric Williams, How to tackle the challenges posed by e-waste China | Al Jazeera (2017), <http://www.aljazeera.com/indepth/opinion/2017/03/tackle-challenges-posed-waste-170318080227696.html> (last visited Jan 11, 2018).

of daily objects². In the United States (US) market, less than 80 million communication devices were sold in 2003; the number was expected to exceed 152 million by 2008³, a growth of over 90 percent in 5 years. Meanwhile, in 2006, more than 34 million TVs have been exposed in the market, and roughly 24 million PCs and 139 million portable communication devices have been produced⁴. In the European Union (EU), the total units of electronic devices placed on the market in 2009 were more than 3.8 billion units, including 265 million computers, roughly 245 million in home consumer electronics, and 197 million consumer appliances (major),⁵ and In China, approximately 20 million refrigerators and more than 48 million TVs were sold in 2001, and nearly 40 million PCs were sold in 2009. Furthermore, the growth rate is increasing every year⁶. Consequently, the volume of WEEE grows rapidly every year and is also believed to be one of the most critical waste disposal issues of the twenty-first century. To be precise, United Nation University estimates that 20 to 50 tons of e-Waste is being generated per year worldwide and suggests that there is an urgent need to develop an estimation technique⁷.

DEFINITION OF E-WASTE

Article 2 of the Basel Convention defines waste as “substances or objects, which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law”. In paragraph four of that article, it defines disposal as “any operation specified in Annex IV” to the Convention.⁴ It is important to note that national provisions concerning the definition of waste may differ, and the same material that is regarded as waste in one country may be non-waste in another country. Electronic waste or e-waste is the term used to describe old, end-of-life electronic appliances such as computers, laptops, TVs, DVD players, mobile phones, mp3 players, etc., which have been

² M. Khurram S. Bhutta, Adnan Omar & Xiaozhe Yang, *Electronic Waste: A Growing Concern in Today's Environment Economics Research International* (2011), <https://www.hindawi.com/journals/ecri/2011/474230/> (last visited Jan 14, 2018).

³ Stefan Schwarzer et al., *Archive ouverte UNIGE E-waste, the hidden side of IT equipments manufacturing and use* (1970), <https://archive-ouverte.unige.ch/unige:23132> (last visited Jan 16, 2018).

⁴ M. Khurram S. Bhutta, Adnan Omar & Xiaozhe Yang, *Electronic Waste: A Growing Concern in Today's Environment Economics Research International* (2011), <https://www.hindawi.com/journals/ecri/2011/474230/> (last visited Jan 14, 2018).

⁵ Discover, *Euromonitor International*, <http://www.euromonitor.com/> (last visited Jan 28, 2018).

⁶ M. Khurram S. Bhutta, Adnan Omar & Xiaozhe Yang, *Electronic Waste: A Growing Concern in Today's Environment Economics Research International* (2011), <https://www.hindawi.com/journals/ecri/2011/474230/> (last visited Jan 30, 2018).

⁷ Stefan Schwarzer et al., *Archive ouverte UNIGE E-waste, the hidden side of IT equipments manufacturing and use* (1970), <https://archive-ouverte.unige.ch/unige:23132> (last visited Jan 31, 2018).

disposed by their original users.⁸ In India, E-waste is covered in Schedule 3 of “The Hazardous Wastes (Management and Handling) Rules, 2003”. Under Schedule 3, E-waste is defined as “Waste Electrical and Electronic Equipment including all components, sub-assemblies and their fractions except batteries falling under these rules.” The EU and its member states operate a system via the European Waste Catalogue (EWC): A European Council Directive, which is interpreted into “member state law”.

E-WASTE REGULATIONS

Most developed countries have strict regulations governing the disposal of electronic and electrical waste. European countries, the United States and others have official ‘take-back’ systems, which recover and dispose of e-waste in an environmentally friendly way. In 2014, these processed 6.5 million tonnes generated by 4 billion people, recycling valuable materials back into the supply chain. The European Union has two comprehensive directives: the Restriction of Hazardous Substances and Waste Electrical and Electronic Equipment. Yet the EU and the United States and Canada dispose domestically of only 40% and 12%, respectively, of the e-waste they generate. These rich nations with strict legislation send most of their e-waste to developing countries. India and China’s e-waste legislation is inefficient and irregularly enforced. China’s system is poorly coordinated; it involves more than ten departments publishing regulations, imposing disposal fees, providing subsidies and monitoring pollution and illegal imports with little crosstalk. Many poor nations, especially in Africa, have few or no laws on e-waste. Around half the components in any personal computer contain mercury, arsenic and chromium are all toxic. The movement of this waste in and out of countries is not being tracked. The Basel Convention of the United Nations, which concerns the movement of hazardous waste across borders, is meant to prevent developed countries from illegally dumping hazardous waste in developing countries. But only 87 parties — and not the United States have ratified it. Few developing countries control imports of toxic e-waste: for example, India’s law fails to ban it. This resulted in 50,000 tonnes of such waste from developed countries being dumped in India in 2012. The shady trading of trash as ‘used electronics’ bypasses such laws entirely. In many developed countries, such as those in the EU, manufacturers are required to take responsibility for the disposal of their electrical and electronic products. However, three-quarters of products sold in Europe are made in developing countries such as China and India. So such measures only worsen the situation in poor nations.⁹

⁸ Violet N. Pinto, *Indian Journal of Occupational and Environmental Medicine* (2008), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2796756/> (last visited Feb 8, 2018).

⁹ Take responsibility for electronic-waste disposal, *Nature News*, <https://www.nature.com/news/take-responsibility-for-electronic-waste-disposal-1.20345#/b3> (last visited Feb 11, 2018).

Similar e-Waste legislation has been introduced in China and other countries as well. For instance, China has established administrative measures to control the pollution of the WEEE directive (The Waste Electrical and Electronic Equipment Directive). Meanwhile, several multinational collaboration agreements are currently taking shape to prohibit or limit the shipment of hazardous waste, including e-Waste, from industrialized to developing countries. Those include the Stockholm Convention on Persistent Organic Pollutants (POPs), the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, and the Ban Amendment of the UN Basel Convention.

GLOBAL IMPACT

Globally the countries are being affected by the e-waste problems. China is the major contributor of e-waste across the world. As e-waste ‘mountains’ grow in cities in China, India, Ghana, and Nigeria, and local populations suffer mounting and serious diseases caused by inhaling the lethal cocktail of lead, cadmium, mercury, and beryllium due burning of e-waste which emits into the atmosphere (or introduces into the water supply). The increasing number of developing countries have called for tighter controls on e-waste regulation. The 1992 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, and its so-called “Ban” Amendment, sought to prohibit its signatory OECD members from shipping to non-OECD members over two decades ago. Both the Convention and the Amendment, however, exempt goods consigned from recycling from this prohibition. Yet, 99% of e-waste exports to Africa and Asia are designated as recyclable goods. Presently, countries hesitate to introduce outright bans on recyclable goods as these goods are indistinguishable from finished goods in international trade (Recycled goods are exported under the same harmonized system (HS) classification codes as finished goods.)¹⁰ Electronic waste in East and South-East Asia rose by nearly 63% in the five-year period between 2010 and 2015, according to the United Nations University’s E-waste monitor, which sampled 11 countries. Overall, the region dumped 12.3 million metric tons (13.6 million US tons) of electronics such as TVs, computers, mobile phones, refrigerators, etc. in 2015 alone, courtesy of its “increasingly affluent population that demands the latest gadgets and appliances.” At 7.2 million, its population is nearly 200 times smaller than China’s. Yet in 2015, people in Hong Kong generated an average of 21.7 kilograms (about 48 lbs) of e-waste each. That’s higher than any other

¹⁰ Menu SLS |SLS Blogs & Ravi Soopramanien and Pamela Usta, E-WASTE: a bigger problem than you think Stanford Law School, <https://law.stanford.edu/2015/10/21/e-waste-bigger-problem-think> (last visited Feb 16, 2018).

country in the region, a dubious honor Hong Kong has held since at least 2009.¹¹ “For many countries that already lack infrastructure of environmentally sound e-waste management, the increasing volumes are a cause for concern,” said co-author Ruediger Kuehr of UN University. A report by Kuehr and his colleagues cites four main reasons for the increasing volumes: more gadgets, more consumers, obsolescence and imports. Improper and illegal e-waste dumping was rife in most countries in the region, regardless of local laws, the study concluded. “Open burning and acid bath recycling in the informal sector have serious negative impacts on processors’ occupational health,” warned study co-author Shunichi Honda.¹² Jim Puckett, the executive director of the Basel Action Network, a watchdog organization focusing on hazardous waste, says he recently came across one in Indonesia. A recent UN study indicates that only 13% of e-waste is managed properly (that is, properly disposed or recycled). The residual e-waste is shipped to Africa and Asia. The UN projects, in line with the EPA’s global growth figures in the preceding paragraph, that in 5 years, the earth’s e-waste reserves will increase by 33% from 49.7 million tons to 65.4 million tons. This represents the weight of 200 Empire State Buildings and 11 Great Pyramids (all three) of Giza. Readers curious about their country’s e-waste generation are referred to the Step Initiative’s website, which contains updated waste generation data on a per-country basis.¹³ The bulk of global e-waste in 2014 (almost 60%) was discarded kitchen, laundry, and bathroom equipment. Personal information and communication technology (ICT) devices such as mobile phones, personal computers, and printers accounted for 7% of e-waste last year. More specifically, e-waste in 2014 comprised:¹⁴

- 12.8 million tonnes of small equipment (such as vacuum cleaners, microwaves, toasters, electric shavers and video cameras);
- 11.8 million tonnes of large equipment (including washing machines, clothes dryers, dishwashers, electric stoves, and photovoltaic panels);
- 7.0 million tonnes of temperature-exchange (cooling and freezing equipment);
- 6.3 million tonnes of screens;
- 3.0 million tonnes of small ICT equipment; and
- million tonnes of lamps.

¹¹ Ananya Bhattacharya, For every person in Hong Kong, there are 48 pounds of electronic waste per year Quartz (2017), <https://qz.com/895504/asia-has-a-growing-e-waste-problem-and-hong-kong-is-its-hidden-villain/> (last visited Feb 18, 2018).

¹² James Temperton, Toxic e-waste in Asia jumps 63% in five years WIRED (2017), <http://www.wired.co.uk/article/un-south-east-south-asia-e-waste-environment> (last visited Feb 21, 2018).

¹³ Step e-waste world map, StEP E-waste World Map - Step 2014, <http://www.step-initiative.org/step-e-waste-world-map.html> (last visited Feb 24, 2018).

¹⁴ UN University, Global E-Waste Volume Hits New Peak in 2014: UNU Report United Nations University, <https://unu.edu/news/news/ewaste-2014-unu-report.html> (last visited Feb 27, 2018).

ENVIRONMENTAL IMPACT

E-waste, or electronic waste, is waste from all sorts of electronics ranging from computers and mobile phones, to household electronics such as food processors, pressure, cookers etc. The effects of improper disposal of this E-waste on the environment are little known; these impacts nonetheless pose very real threats and dangers to the global environment at large. Threats posed by E-waste to the environment are an improper disposal of these electronic wastes affect the soil, air, and water components of the environment.

- Effects on air: One of the most common effect of E-waste on air is through air pollution. For example, a British documentary about Lagos and its inhabitants, called Welcome to Lagos, shows a number of landfill scavengers who go through numerous landfills in Lagos looking for improperly disposed electronics which includes wires, blenders, etc., to make some income from the recycling of these wastes. These men were shown to burn wires to get the copper (a very valuable commodity) in them by open air burning which can release hydrocarbons into the air.
- Effects on water: When electronics containing heavy metals such as lead, barium, mercury, lithium (found in mobile phone and computer batteries), etc., are improperly disposed, these heavy metals leach through the soil to reach groundwater channels which eventually run to the surface as streams or small ponds of water. Local communities often depend on these bodies of water and the groundwater. Apart from these chemicals resulting in the death of some of the plants and animals that exist in the water, the intake of the contaminated water by humans and land animals results in lead poisoning. Some of these heavy metals are also carcinogenic.
- Effects on soil: Toxic heavy metals and chemicals from e-waste enter the “soil-crop-food pathway,” one of the most significant routes for heavy metals’ exposure to humans. These chemicals are not biodegradable, they persist in the environment for long periods of time, increasing the risk of exposure. These dangers posed by improper disposal on the environment ultimately have impacts on human beings -human cost; the health effects of these toxins on humans include birth defects (irreversible), brain, heart, liver, kidney and skeletal system damage. They also significantly affect the nervous and reproductive systems of the human body. When computer monitors and other electronics are burned, they create cancer-producing dioxins which are released into the air we breathe. If electronics are thrown in landfills, these toxins may leach into groundwater and affect local resources. Thus the improper disposal of e-waste not

only has effects on the environment, it indirectly and ultimately poses grave dangers to humans and livestock.¹⁵

SCENARIO IN INDIA

The Information Technology Industry of India has seen a massive growth during the 1990's. It has also intensified the problem of E-waste in India. Sixty-five cities in India generate more than 60% of the total E-waste generated in India. Ten states generate 70% of the total E-waste generated in India. Maharashtra ranks first followed by Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab in the list of E-waste generating states in India. Among the top ten cities generating E-waste, Mumbai ranks first followed by Delhi, Bangalore, Chennai, Kolkata, Ahmedabad, Hyderabad, Pune, Surat and Nagpur. The problem of management of E-Waste in India is two-fold-

- The recycling of E-Waste is not proper in India. The workers have low literacy and are unaware of the potential hazards arising out of the E-waste. These workers are poor and they include women and children who are more vulnerable to the hazardous effects of E-waste.
- India is also a dumping ground of the E-waste of developed countries as they sell their obsolete electrical and electronic waste in Indian Markets.

Due to these irregularities the management of E-Waste in India is very improper. For example- If there is a Supervisor of the Company who has no knowledge about the E-waste and there are obsolete computers lying in the company which are not in the working conditions and cannot even be resold he will simply put them in the warehouse. This is the policy of 'Out of Sight, Out of Mind'.¹⁶ Although there are legislations to regulate the disposal and management of E-waste in India, there is no proper implementation of these legislations. The various legislations enacted by the Government of India are-

- The Hazardous Wastes (Management and Handling) Amendment Rules, 2003;
- Guidelines for Environmentally Sound Management of E-waste, 2008; and
- The e-waste (Management and Handling) Rules, 2011.

¹⁵ Website Admin, Impacts of E-Waste on the environment E-Terra Technologies Limited (2017), <http://www.etera.com.ng/articles/impacts-e-waste-environment/> (last visited Feb 27, 2018).

¹⁶ Guest Post, E-Waste and its Legal Implications in India iPleaders (2015), https://blog.iplayers.in/e-waste-and-its-legal-implications-in-india/#_ftn2 (last visited Feb 27, 2018)

Following Supreme Court directions, the states have notified a set of hazardous waste laws and built a number of hazardous waste disposal facilities in the last ten years. However, the CAG report found that over 75 per cent of state bodies were not implementing these laws.¹⁷ The challenges of e-waste management can be classified as lack of appropriate infrastructure, legislation and framework for end-of-life products. The following describe the implementation challenges for better e-Waste management in India:

- Due to diversion of large chunks of e-wastes from retail consumers to informal recyclers and demand-supply mismatch organized e-recyclers are not getting adequate e-wastes to recycle.
- Lack of legislation has been the core concern for e-waste management. There is no centralized mandatory or strict legislation in this regard. For better management, the legislation must clearly define e-waste and the limitations in terms of quantities of e-waste generated.
- Collection centres are currently present only in a few cities in India and the collection process for these facilities are restricted due to logistical and geographical problems.
- Lack of motivation for the top management of producers is one of the major concerns and is unable to drive the e-Waste management initiative. 90% of Indian electronic producing companies and IT companies are not in favour of the EPR concept.
- Donation of obsolete equipment by companies to schools without any monitoring as to what happens to the donated material when it reaches its end of life. Hence the loop of reverse supply chain is unable to function in an organized manner.
- There is no recycler for materials of lamps (CFL bulb, tube light etc.) in India because of cheaper sources in China. Hence lamp recycling is a great challenge in India. There is no recycler for Ni-Cd batteries, Alkaline batteries and Dry cell batteries within the country. Such materials are either dumped in landfills resulting in the loss of resources or exported to authorized recyclers in foreign countries resulting in logistic costs.

The Ministry of Environment, Forest and Climate Change notified the E-Waste Management Rules, 2016 on 23 March 2016 in supersession of the e-waste (Management & Handling) Rules, 2011.

E-WASTE COLLECTION CENTRES IN INDIA

Collection of e-waste is of prime importance for environmentally sound management of e-waste. Collection centre can be established to collect the E-waste individually or jointly or

¹⁷ advocatekhoj.com, Research Foundation for Science vs. Union of India | Latest Supreme Court Judgments | Law Library | AdvocateKhoj, <http://www.advocatekhoj.com/library/judgments/announcement.php?WID=2253> (last visited Feb 28, 2018).

it can be a registered society or a designated agency or a company or an association, thus there is ample scope for evolving various ways in which a collection centre can be set up and functional. A collection centre is a store / warehouse where the E-Waste collected from consumers, bulk consumers, urban local bodies and retail outlets/collection-points/collection-bins/mobile-units etc. established by producers or collection centres, can be received and stored safely for necessary channelization for dismantling/ recycling. As per Rule 4(3), the producer is responsible for 'setting up collection centres or take-back systems either individually or collectively'. The decision about the mechanism for collection can be decided by the individual producer in accordance with their company policy. However, such details shall be specified while obtaining authorization from SPCB (State Pollution Control Board). These guidelines suggest the following options and requirements for setting up Collection Centres:¹⁸

- Collection centres can be established by various ways. If a collection centre is set up for a particular producer, it may be called individual collection centre. If a collection centre caters the EPR requirements of multiple producers it may be called common collection centre. All collection centres require authorization from SPCB (STATE POLLUTION CONTROL BOARD) of the respective States.
- In case a producer himself sets up a collection centre, he shall take a separate authorization from SPCB (STATE POLLUTION CONTROL BOARD) for setting up such individual collection centre.
- The Producer may organize take-back system through their retailers or through service centres and set up collection points or bins or drop-off points and link them to their authorized individual collection centres. Such collection points can also be set-up by authorized common collection centres.
- Producer may organize take-back system through their retailers or service centres and set up collection points or bins and channelize the E-waste directly to registered dismantlers or recyclers.
- The collection points can be designated places where e-waste can be collected through residential areas, office complexes, commercial complexes, retail outlets, customer care stores, educational and research institutions, resident welfare associations (RWAs), NGOs working with rag pickers, etc. These collection points can be financed by producers or common collection centres (on behalf of the producers) to channelize the E-waste to registered dismantler or recyclers. The e-waste collected through these points should be transported to collection centres or registered dismantling or recycling

¹⁸ Implementation of E-waste Rules, 2011, Implementation of E-Waste Rules 2011 Guidelines (2011), <http://cpcb.nic.in/displaypdf.php?id=aHdtZC9JbXBsaW1lbnRhdGlvbkUtV2FzdGUucGRm> (last visited Feb 28, 2018).

plants within a stipulated time period as per rule 12. These collection points do not require to take authorization from SPCB (STATE POLLUTION CONTROL BOARD).

- Collection Bins could be installed in public places such as kerbsides, restaurants, malls, offices etc. which can be owned by the authorized collection centres or the producer. The contact details of authorized collection agencies should be printed on these bins for reference purposes of the general public. The e-waste collected in these bins should be transported to collection centres or channelized to registered dismantler or recyclers by the producers. These collection Bins do not require authorization.
- Mobile collection vans can also act as collection systems for door to door collection of e-waste or from institutions/ individuals/small enterprises and such vans shall be linked to collection centre or provided by producer to channelize the e-waste to collection centres or registered dismantler or recyclers. A mobile collection van does not require authorization but their detail has to be provided to SPCB (STATE POLLUTION CONTROL BOARD) while seeking authorization by the producers or collection centres.
- SPCB (STATE POLLUTION CONTROL BOARD) shall ensure that authorized collection centres comply with the provisions of the Rules and ensure that the e-waste collected by them is stored in a secured manner and no damage is caused to the environment during storage and transportation till the e-waste reaches registered dismantler(s) or recycler(s) by undertaking periodic inspections and verifications
- The Rules specify that Collection Centres are allowed to store e-waste for a maximum period of 180 days. However, this period may be extended up to one year in the exceptional cases with genuine reasons when the Collection Centres are located in the States, which do not have any registered dismantling or recycling facility and are unable to send the e-waste for recycling within the stipulated time period.

MITIGATION OF E-WASTE

- Enhanced Law Enforcement: The government must take steps to allocate sufficient resources to rigorously enforce existing environmental laws and regulations. Increasing the accountability of local government officials and establishing greater public awareness are likewise essential for enhanced law enforcement.
- Minimization or Elimination of Manufacturing related Pollution Sources: The government should adopt more appropriate models to deal with the e-waste problem. For example, a manufacturer of electronic products should take the right steps and measures toward the reduction and prevention of e-waste problems during the manufacturing process. Additionally, the government should establish national or local e-waste disposal centers to minimize the possibility of e-waste pollution and speed up the development of its environmental protection industry and agencies

- **Increased International Collaboration:** International collaboration is one of the most effective ways to resolve the e-waste crisis. Disposal of e-waste to other countries, especially in an inappropriate manner, may temporarily seem to alleviate a domestic problem. This sentiment is at best a narrow sense of the world by those who derive some economic benefit at either end of the process. E-waste crisis is a global problem due to its source and the nature of environmental pollution.
- **Donate used electronics to social programs and help victims of domestic violence, child safety initiatives, environmental causes, and more.** Ask your student representatives for a postage paid mailer for your cell phone or ink cartridge. For each item received, the World Wildlife Fund will receive one dollar.¹⁹
- **Re-use:** It constitutes direct second hand use or use after slight modifications to the original functioning equipment. It is commonly used for electronic equipment like computers, cell phones, etc. Inkjet cartridge is also used after refilling. This method also reduces the volume of e-waste generation. We can use above mentioned methods for treatment and disposal of e-waste. The better option is to avoid its generation. To achieve this, buy back of old electronic equipment shall be made mandatory. Large companies should purchase the used equipment back from the customers and ensure proper treatment and disposal of e-waste by authorized processes. This can considerably reduce the volume of e- waste generation.
- **Recycling of e-waste:** Monitors, keyboards, laptops, modems, telephone boards, hard drives, floppy drives, Compact disks, mobiles, fax machines, printers, CPUs, memory chips, connecting wires & cables can be recycled. Recycling involves dismantling i.e. removal of different parts of e-waste containing dangerous substances like PCB, separation of plastic, segregation of ferrous and non-ferrous metals and printed circuit boards. Recyclers use strong acids to remove precious metals such as copper, lead, gold. The value of recycling from the element could be much higher if appropriate technologies are used. The recyclers are working in a poorly ventilated enclosed areas without a mask and technical expertise results in exposure to dangerous and slow poisoning chemicals. The existing dumping grounds in India are full and overflowing beyond capacity and it is difficult to get new dumping sites due to scarcity of land. For disposing wastes under landfilling, it has to be kept in mind that landfill cannot be constructed within 200 meters of any lake or pond, 100 meters of river, within 100 years of flood plain, 200 meters of highways and in some restrictions to habitation, public parks, critical habitat area, wetlands, ground water table, airports, water supply well, coastal regulation zone, unstable zone, buffer zone, and other areas decides by the

¹⁹ 6 ways to minimize your e-waste, Sustainability at Harvard (2016), <https://green.harvard.edu/tools-resources/how/6-ways-minimize-your-e-waste> (last visited Feb 28, 2018).

designers. Therefore recycling is the best possible option for the management of e-waste.²⁰

CONCLUSION

The problem of e-waste has reached to an alarming stage. The e-waste has to be disposed of properly or else they will turn out into a menace and which leads to killing a lot of people and causing serious health problems. There is an increased focus from Indian regulators towards mitigation of e-waste for sustainable environment & health of the individuals. The same can be evidenced from the new Companies (Amendment) Act, 2017, which requires certain companies to compulsorily carry out corporate social responsibility activities, including environmental development. In order to avoid adverse consequence, it is advisable that periodic internal audits should be conducted for identifying non-compliances and addressing them effectively. Further, compliance with applicable environmental laws, works to build brand image and product value of the companies, for acting in an environmentally responsible manner. The proper disposal and effective management of e-waste requires the Government authorities to enact strict regulatory laws. Harmonizing the framework of laws and indicators will be a substantial step towards reaching the global e-waste solution. The need of the hour is an urgent approach to the e-waste hazard by technical and policy-level interventions. The implementation, capacity building and also enhance in public awareness towards e-waste management, so that it can convert this challenge into an opportunity and to show the world that India is ready to deal with future problems and can set global credible standards concerning environmental and occupational health.

²⁰ ELECTRONIC WASTE MANAGEMENT IN INDIA: ISSUES AND CONCERNS, International Journal of Law and Legal Jurisprudence Studies, <http://ijlljs.in/electronic-waste-management-in-india-issues-and-concerns/> (last visited Feb 28, 2018).