

Legal Framework on E-Waste Management: A Critical Analysis

THESIS

**SUBMITTED TO THE
BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY
LUCKNOW**

**BABASAHEB
BHIMRAO
AMBEDKAR
UNIVERSITY**



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Doctor of Philosophy

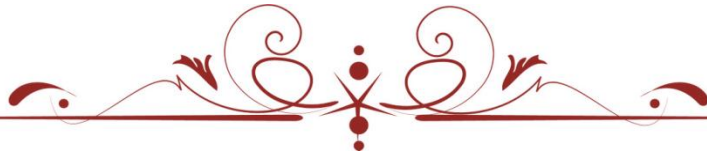
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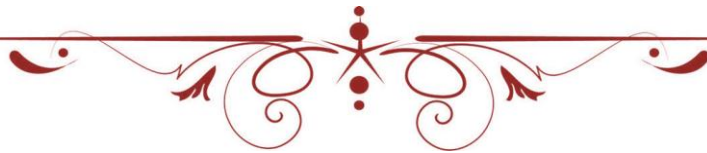
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2021



**THIS THESIS IS DEDICATED TO
MY FAMILY AND TEACHERS**





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DECLARATION

I, **ANIL KUMAR**, hereby declare that this research work embodied in this Ph.D. thesis titled “**Legal Framework on E-Waste Management : A Critical Analysis**” has been carried out by me under the supervision of **Dr. Anis Ahmad, Assistant Professor**, Department of Law, School of Legal Studies, Babasaheb Bhimrao Ambedkar University Lucknow, 226025.

This Research work is an original work and it has not been previously submitted in part or full for any other degree or diploma in this or any other University. This is also to declared that the thesis is essentially free from all kinds of plagiarism.

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CERTIFICATE


This is to certify that the thesis titled “**Legal Framework on E-Waste Management: A Critical Analysis**” submitted by **Mr. Anil Kumar** is an original research work and has not been previously submitted in part or full for the award of any other degree or diploma to this or any other university.

This thesis submitted to Babasaheb Bhimrao Ambedkar University, Lucknow satisfies all the requirements as stipulated in the *Doctor of Philosophy (Ph.D.) regulations, 1999 as amended in 2013* and it is fit for submission and evaluation for the award of the degree of Doctor of Philosophy of the

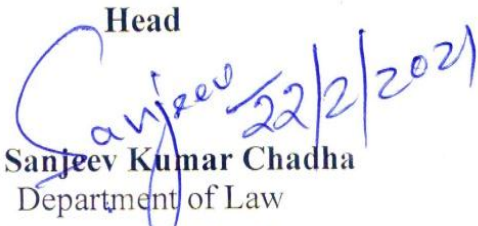
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Anil Kumar

Anil Kumar

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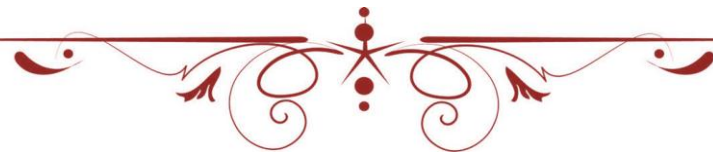
LIST OF ABBREVIATIONS

Ag	Silver
Al	Aluminium
ARF	Advanced recycling fee
Ban	Basel Action Network
BCRC	Basel Convention Regional Centre
CD	Compact disc
Cd	Cadmium
CEC	Commission for Environmental Cooperation
CFC	Compact Fluorescent
CPCB	Central Pollution Control Board
CRT	Cathode ray tubes
Cu	Copper
DfE	Design for environment
DVD	Digital versatile disc
ECDM	Environmentally conscious design and manufacturing
EEE	Electrical and electronic equipment
EHS	Environmental, health and safety
EOL	End of Life
EPA	Environment Protection Act
EPR	Extended Producer Responsibility
EU	European Union
E-WASTE	Electronic waste
GWP	Global warming potential
Hg	Mercury
HW	Hazardous Waste

IC	Integrated circuit
ICT	Information and communication technologies
IT	Information technology
LCD	Liquid crystal display
MSW	Municipal Solid Waste
NGO	Non-Governmental Organisation
NGT	National Green Tribunal
OECD	Organization for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
PBB	Polybrominated biphenyls
PBDEs	Polybrominated diphenyl ethers
PC	Personal computer
PCB	Printed Circuit Board
PRO	Producer responsibility organization
PVC	Polyvinyl chloride
PWB	Printed Wiring Board
RoHS	Restriction of the use of certain hazardous substances
RSP	Respiratory suspended articles
StEP	Solving the e-waste Problem Initiative
TV	Television
UNEP	United Nations Environmental Programme
VAT	Value added tax
VCR	Video camera recorder
WEEE	Directives on Waste Electrical and Electronic Equipment
WTO	World Trade Organisation



CHAPTER-I
INTRODUCTION



CHAPTER-I

INTRODUCTION

1.1. INTRODUCTION

Over the recent past decade, the electronics industry has revolutionized the world so much so that electrical and electronic products have become ubiquitous of today's life around the planet. These products are today all pervasive in areas such as medicine, mobility, education, health, food supply, communication, security, environmental protection, culture, leisure and entertainment. Such appliances include many domestic devices like refrigerators, washing machines, mobile phones, personal computers, printers, toys and TVs. Electronic waste, or E-waste, refers to electronic products that have been retired from use or discarded. Managing E-waste has become a serious problem as new sales and replacement rates of electronic products have increased.¹ The volume of electronic waste is growing at an increasing rate. The extensive adoption of electronic products, advances in technology, the tendency of consumers to purchase multiple electronics, social pressure and the rapid obsolescence of products are some of the major contributing factors.²

A Report on E-waste presented by the United Nations University-Institute for the Advanced Study of Sustainability on July 01, 2020, global generation of E-waste was estimated to be 53.6 million tons per year. Asia was found to be the largest producer of E-waste with a generation rate of 24.9 million tons per year which amounts to a per capita generation rate of 5.6 kg/person-year.³ About 80% of the E-wastes are transported unlawfully from developed to developing countries. It has been estimated that 60–70% of the E-waste collected from Europe is shifted to Asian and African countries for dismantling and recycling. The high amount of E-waste generated throughout the globe are due to the products least life span, cheap/low prices, lifestyles of consumers, change of consumption patterns or increased consumption, illegal transboundary movement, low durability, which are non-cost

¹ Dejo Olowu, E-Wastes in Developing Countries -Legal and Policy Responses, 8/1 LEADJ 59 (2012), available at <http://www.lead-journal.org/content/12059.pdf>. (Visited on August, 10, 2020.)

² Nivedita Chaudhary, "Electronic Waste in India: A Study of Penal Issues" 2 *ILI Law Review* (2018).

³ Vanessa Forti, Cornelis P. Balde, et.al., The Global E-waste Monitor 2020 Quantities, flows, and the circular economy potential 24 (United Nations University, 2020).

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effective, and unregulated. This rapid increase in E-waste generation is linked with the time to time up-gradation advances in technologies, and further continuous fluctuation or fall in prices. Most of the developing countries lack proper disposal, safety measure, and proper management of the E-waste pollution.⁴

E-waste is a general term that encompasses a huge variety of products that have electric and electronic components in them. Electronic waste, or E-waste, consists of obsolete electrical and electronic equipment. Obsolete EEE includes computers, televisions, mobile phones, printers and white electronic goods, such as refrigerators. It is very difficult to give a precise definition due to the complexity in the vast number of products that could be included therefore it is possible to define them broadly. E-waste for short or Waste Electrical and Electronic Equipment is the term used to describe old, end-of-life or discarded appliances using electricity. In other words the term “E-waste” is used as a generic term embracing all types of waste containing electrically powered components. It includes computers, consumer electronics, fridges etc which have been disposed of by their original users.⁵

Electrical and electronic waste, also known as electronic waste or WEEE, or in short called E-waste, is used to describe obsolete or end of life electrical and electronic equipment. There is no generally accepted definition of E-waste around the world. However, E-waste is often misunderstood as comprising only computers and related IT equipment, or worse still, mistaken as email spam.

According to the European Directive 2002/96/EC, “Waste electrical and electronic equipment, including all components, subassemblies and consumables which are part of the product at the time of discarding.”

The Directive 75/442/EEC, Article 1(a)⁶, defines as “E-waste encompasses a broad and growing range of electronic devices ranging from large household devices such as refrigerators, air conditioners, cell phones, personal stereos, and consumer electronics to computers which have been discarded by their users.

⁴.Ministry of Environment & Forests and Central Pollution Control Board (2008).guidelines for environmentally Sound Management of e-waste, (visited on Feb.3, 2020).

⁵ Chuck Lobert “E-Waste: An Often-Forgotten Environmental Issue” 1 VCS (2019).

Available At: <https://www.vcsolutions.com/blog/e-waste-an-often-forgotten-environmental-issue>

⁶ EU Directive on WEEE

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According to Basel action network the e-waste is defined as “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”⁷

United Nations University’s initiative on solving the E-waste Problem defines E-waste as, “E-Waste is a term used to cover items of all types of electrical and electronic equipment and its parts that have been discarded by the owner as waste without the intention of re-use.”⁸

Organization for Economic Co-operation and Development (OECD), E-waste has been defined as “any appliance using an electric power supply that has reached its end-of-life.”⁹

According to E-waste (Management and Handling) Rules, 2016 section 3(p) defines as “Electrical and Electronic Equipment” means equipment which is dependent on electric current or electro-magnetic field in order to become function.”¹⁰ And section 3(r) defines E-waste as “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.”¹¹

Composition of E-waste is very diverse and differs in products across different categories. It contains more than 1000 different substances, which fall under “hazardous” and “non-hazardous” categories. Broadly, it consists of ferrous and non-ferrous metals, plastics, glass, wood & plywood, printed circuit boards, concrete and ceramics, rubber, monitors, printers, keyboards, central processing units; typewriters, mobile phones and chargers, remotes, compact discs, headphones, batteries, liquid crystal display/Plasma television, air conditioners, refrigerators and other household appliances. Iron and steel constitutes about 50% of the e-waste followed by plastics (21%), non ferrous metals (13%) and other constituents. Non-ferrous metals consist of metals like copper, aluminium and precious metals ex. silver, gold, platinum,

⁷ Basel Action Network, 2005

⁸ G.Davis and S. Heart, “Electronic Waste: The Local Government Perspective in Queensland, Australia” 1031-1039 RCR 52 (2008).

⁹ Fatihah Suja “E-Waste Management Scenarios in Malaysia” 1 *JWM* (2014).

¹⁰ E-waste (Management and Handling) Rules, 2016

¹¹ E-waste (Management and Handling) Rules, 2016

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palladium etc¹². The presence of elements like lead, mercury, arsenic, cadmium, selenium, and hexavalent chromium and flame retardants beyond threshold quantities in e-waste classifies them as hazardous waste. The kinds of components, which are found in Refrigerator, Washing Machine, Personal Computers and Television, are described.¹³

A surprising 320 tons of gold and more than 7,500 tons silver are now used annually to make personal computer, cell phones, tablet, laptop and other new electronic and electrical products worldwide, adding more than \$21 billion in value each year to the rich fortunes in metals eventually available through “urban mining” of E-waste. Most of the valuable metals will be wasted, however just 15% or less is recovered from E-waste today in developing and developed countries. E-waste contains precious metal “deposits” 40 to 50 times richer than ores mined from the ground.¹⁴

It is highly imperative that E-waste gets recycled in a safe, appropriate, and efficient manner. Conversely, the scenario in most developing countries like India is quite unsettling. The reasons for this situation is poor infrastructure, lack of awareness and ineffective implementation of legislation, as a very small percentage of the total E-waste generated gets recycled in India. Most of the electronic waste is being sold as scrap and is further smashed, dismantled and recycled by the informal sector.¹⁵

Currently, a majority of E-waste in India is being managed by the large organized informal sector which does not have the adequate means or awareness to deal with E-Waste appropriately. Informal sector indulges essentially in manual dismantling where they end up in open burning to recover precious materials used in E-waste, and open dumping of residual. This manual recycling process by the informal sector is often known as “backyard recycling syndrome”, which is prevalent in almost all the developing countries to an extent. Moreover, the materials which are retrieved from E-wastes are often re-sold and re-exported to other countries. Therefore, this in turn leads to ineffective E-waste management which actually causes

¹² Rajya Sabha Secretariat “E-Waste in India” 3 New Delhi (2012).

¹³ Needhi sadan, Santhanam et al. “Electronic waste-an emerging threat to the environment of urban India” 36 *JEHSE* 12(2014).

¹⁴ Vanessa Forti, Cornelis P. Balde, et.al., E-waste: Annual gold, silver 'deposits' in new high-tech 24 (United Nations University, 2014).

¹⁵ Akanksha Manish ,Paromita Chakraborty “E-Waste Management in India: Challenges and Opportunities” 2 *TERI* (2019).

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huge damage to the environment as well as human health. It has been noticed that informal recycling is the most pressing environmental issue associated with E-waste due to inherent dangers of toxicity.¹⁶

The organized informal sector extract and recover valuable materials from E-waste with the use of the primitive tools and methods of extraction such as open burning of plastic waste, exposure to toxic solders, and acid baths. It has been reported that about 95 percent of electronic waste in India is treated and processed in urban slums, where untrained workers carry out practices unsafe for human and environmental health as it results in the pollution of the land, air, and water. Seelampur is the largest informal sector of E-waste dismantling in India. Mandoli, a region near Delhi is a similar place where E-waste burning takes place.¹⁷

Accidental leakages and evaporation of these substances occur at the electronic wastes dumping sites. As a result, most of these salvageable materials escape into the soil, polluting big areas of lands and making them unhealthy for farming. Moreover, metals such mercury, cadmium and lead, which are usually discovered in device circuit boards, may percolate into groundwater, triggering devastating health issues. First-hand reports of the Alaba Computer Village in Lagos, Nigeria, disclosed lead, mercury, cadmium, arsenic, antimony trioxide, poly brominated flame retardants, and selenium, chromium, and cobalt contents in soil samples at rates far greater than usual.¹⁸

There are numerous health effects also of these crude methods of disposal of E-waste. For instance, reports have shown that continued contact and exposure to these hazardous materials of E-wastes ends in negative birth consequences, cancer, long-term and permanent neurologic damage, and end-organ disease of the thyroid, lungs, liver, and kidneys.¹⁹

It has been reported by the Centre for Occupational and Environmental Health at Maulana Azad Medical College in New Delhi that extreme level of lead, mercury

¹⁶ Lakshmi Raghupathy, Christine Kruger "E-Waste Recycling In India: Bridging The Gap Between The Informal And Formal Sector" 4 *ISWA* (2012).

¹⁷ Anwesha Borthakur and Kunal Sinha "Electronic Waste Management in India: A Stakeholder's Perspective" 4 *EGJ* 36 (2013).

¹⁸ Nnorom and Osibanjo "Overview of Electronic Waste Management Practices and Legislations, and Their Poor Applications in the Developing Countries" 10 *RCR* 52(2008).

¹⁹ B.R. Babu and A.K. Parande "Electrical and electronic waste: a global environmental problem" 307 *WMR* 25 (2007).

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and chromium is discovered in the bodies of these recyclers and dismantlers. This subsequently has a bearing on their bodies and results in damage to the respiratory, urinary and digestive systems. It also damages the immune system and has been associated to certain kinds of cancer.²⁰ Therefore, the need of the hour is proper handling of electronic wastes to avert human suffering and in the foreseeable future; the long-term degradation of our environment and ecosystem is averted as well.

E-waste is known to contain a wide variety of toxic or otherwise hazardous components that may constitute a serious risk for human health and the environment if they are released during processing, recycling or disposal. For example, E-waste contains a wide range of heavy metals, such as lead, cadmium and mercury, and also persistent organic compounds, such as brominated flame retardants and phthalates. However, it should be noted that many of these pollutants are not present as pure compounds in the E-waste, but are constituents of complex materials, e.g. flame retardants in plastics, or are hidden inside electrical components, such as mercury in switches, and are therefore difficult to isolate and separate from the other components. These facts make the recycling of E-waste very complicated and costly, although it is obvious that it is necessary from an environmental point of view. To avoid serious environmental pollution and human exposure, adequate treatment of E-waste is crucial, particularly considering the huge amounts of E-waste that is being produced globally.²¹

E-waste can also be considered as a resource, as it contains many valuable components that actually may be beneficial to recover. For example, it usually contains substantial amounts of copper (often 5-20% by weight), and also relatively high levels of several precious metals, such as gold (0.1%), silver (0.2%) and palladium (0.005%), which originally have been included in the EEE because of their resistant to oxidation and superior conductivity. These metals together make up the major economical incentive for recycling of E-waste, as they may constitute over 95% of its total value. However, also other metals and materials may be worth recycling

²⁰ R. Khanna, R. Rajarao et.al., *Environmental Impact of Processing Electronic Waste -Key Issues and Challenges* 14 (Intech Publication, 2016).

²¹ Daniel Mmereki and Liu Hong, *The Generation, Composition, Collection, Treatment and Disposal System, and Impact of E-Waste*, 18 (In Tech Open, 2016).
Available at: <https://www.intechopen.com/books/e-waste-in-transition-from-pollution-toresource/the-generation-composition-collection-treatment-and-disposal-system-and-impact-of-e-waste> (visited on January 15, 2020).

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from an economical point of view, e.g. lead, nickel and various plastics. End-of-life treatment of E-waste always leads to potential risks to human health and the environment.²² This is simply a consequence of the multitude of hazardous compounds that are present in EEE, and of the methods used to treat the waste. Land filling and incineration of unsorted E-waste are options that do not allow the removal of hazardous (or valuable) components, and may therefore potentially lead to leaching and emissions of all hazardous compounds in the E-waste.

Recycling, involving the removal of hazardous compounds and recovery of valuable components, represents an opportunity both from environmental and resource conservation perspectives. However, since recycling processes seldom are perfect and completely removes all hazardous compounds from the waste, these processes are also associated with potential hazards and risks, and not least during the uncontrolled recycling activities carried out in many developing countries.

As far as global E-waste management is concerned, Switzerland is the first country to implement the organized E-waste management system in the world. Extended producer responsibility and advance recycling fee are the backbone of E-waste management system in Switzerland and other developed countries. Advanced countries like USA, UK, France and Germany generate 15 to 20 million tons of E-waste annually and are among the largest generators of E-waste.²³ But these countries also have standardized E-waste management processes in place. Proper E-waste management, from efficient sourcing and collection right up to extraction and disposal of material, has ensured that this huge pile of junk turns into a lucrative business opportunity. Due to very stringent environmental standards, the cost of collection, pre-processing, recycling and disposal are pretty high. So for every organized recycler in the first world countries, there are quite a few who pose as recyclers and are mere brokers who ship these obsolete items to developing countries like India and China in the pretext of donation or second hand goods. With very ambiguous laws related to environmental protection, India, China and a few African countries have become dumping sites to the first world countries. There are many countries that have already

²² Rakesh Johri, *E-waste: Implications, regulations and management in India and current global best practices* 33 (TERI, New Delhi, 2008).

²³ Vanessa Forti, Cornelis P. Balde, et.al., *The Global E-waste Monitor 2020 Quantities, flows, and the circular economy potential* 104-114 (United Nations University, 2020).

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started the “take back” system for electronic products and they also have dedicated laws on E-waste management.

The current Indian scenario of E-waste management is different from the worldwide. The practice of E-waste is a serious issue because of the informal recycling activities. Therefore, quantification of E-waste in India is very difficult and, there is no mechanism and policy to check the flow of E-waste in the system. India is the third biggest producer of E-waste in the world; As per the United Nations University report, 3.2 million tonnes of E-waste was generated in the country in 2019, a UN report have warned that the volume of global E-waste is likely to rise by 21 percent in next three years.²⁴ In India E-waste collection, transportation, segregation, dismantling, recycling and disposal is done manually by untrained labours in informal sector. Due to low awareness and sensitization E-waste is thrown along with garbage which is collected and segregated by rag pickers. E-waste contains reusable and precious material. Rag pickers sell this E-waste to scrap dealers and run their livelihood. The scrap dealers supply the E-waste to recycling industries. The recyclers use old and hazardous technologies and equipment, to recycle/treat the E-waste.²⁵

In India, probably the E-waste is given to the rag pickers who pay some amount to the customer from whom they are collecting the waste. Most of the activities, like collection, transportation, segregation, dismantling, recycling, disposal, etc., are carried out by informal sector. The rag pickers collect all kind of waste like papers, books, newspapers, plastic, cardboard, polythene, metals, etc. including E-waste, and earn their livelihood by selling it to middlemen or scrap dealers. This is a very good source of income not only for rag pickers but also for middlemen and scrap dealers. E-waste is mostly handled by unskilled workers and they do not take proper safety measures. Recycling and disposal is not properly done due to lack of appropriate technology. Also, very few companies are there which have implemented “take back” system voluntarily. There is no clear data on the quantity generated and disposed of each year and the resulting extent of environmental risk.²⁶ According to the literature review it’s revealed that about 50% of the public are aware of

²⁴ *Supra note* 01 Page no. 107

²⁵ Vanessa Forti, Cornelis P. Balde, et.al., *The Global E-waste Monitor 2020 Quantities, flows, and the circular economy potential* 74 (United Nations University, 2020).

²⁶ Vinod Kumar and Ruchi Garg, “Sustainability and E-waste management scenario in India” 43 *ICIRD* 31 (2010).

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environmental and health impacts of the electronic items. Hence, there is an urgent need of implementation of proper E-waste management system in India.

Environmental concerns among manufacturers as well as the awareness of consumers regarding environmental issues are not very high. While the government has passed several environmental protection laws, their enforcement remains questionable. However, there is increasing pressure on both the government as well as the private sector from strong environmental NGOs. Electronics, the largest and fastest growing manufacturing industry in the world, aggressively promotes a culture of fast obsolescence and increased consumption. And the environmental consequences are disastrous.²⁷ E-waste is the fastest growing portion of waste in developed countries with respect to this waste neither the industry, nor the consumers, bears the downstream costs for safe disposal of the enormous quantities of wastes produced.

At the International level there are several international legal instruments developed for international co-operation in the field of hazardous sustains for environmentally sound management across the border. In order to deal with the hazardous substances and its sound management the global community adopted the Basel Convention in 1989. This Convention talks on the control of Transboundary Movements of Hazardous Wastes and their Disposal is the most comprehensive and pioneering global environmental treaty on hazardous wastes and other wastes. It was negotiated under the auspices of the United Nations Environment Programme in the late 1980s. India is a signatory to the Basel Convention, which requires countries to ensure that hazardous wastes and hazardous recyclable materials are managed in an environmentally sound manner. It deals with the question of the transboundary movements of hazardous and other wastes.

The preamble of the Convention convinced that member States should take necessary measures to ensure that the management of hazardous wastes and other wastes including their transboundary movement and disposal is consistent with the protection of human health and environment It also recognised that the increasing desire for the prohibition of transboundary movements of hazardous wastes and their

²⁷Needhidasan, Santhanam et al. "Electronic waste - an emerging threat to the environment of urban India" 36 *JEHSE* 12 (2014).

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disposal in other States, especially developing countries. The Convention laid down the general obligations of the member States which includes minimum reduction of the generation of hazardous and other wastes and substantial reduction of their transboundary movements. The Convention declares that illegal traffic in hazardous wastes or other wastes is criminal. Furthermore, a signatory State cannot ship hazardous waste to any country that has not signed the treaty.²⁸ A State party to the Convention shall prohibit all persons under its national jurisdiction from transporting and disposing of hazardous wastes or other wastes unless such persons are authorized or allowed to perform such types of operations. The obligations under this Convention of States in which hazardous waste and other wastes are generated to require that those wastes are managed in an environmentally sound manner may not under any circumstances be transferred to the States of import or transit.²⁹

Article, 1 of the convention talks about the scope of the convention. It provides that the following wastes that subject to transboundary movement and shall be “Hazardous wastes” for the purposes of this Convention.³⁰

1. (a) Wastes that belong to any category contained in Annex I, unless they do not possess any of the characteristics contained in Annex III.

1. (b) Wastes that are not covered under paragraph (a) but are defined as, or are considered to be, hazardous Wastes by the domestic legislation of the Party of export, import or transit.

2. Wastes that belong to any category contained in Annex II that are subject to transboundary movement shall be other wastes for the purposes of this Convention.

3. Wastes which, as a result of being radioactive, are subject to other International control systems, including international instruments, applying specifically to radioactive materials are excluded from the scope of this Convention.

The Basel Convention requires the prior informed consent of other states before environmentally harmful activities may be undertaken. The essence of the control system established by the Basel Convention is the need for prior, informed,

²⁸ Michelle M. Vilcheck, “The Controls on the Transfrontier Movement of Hazardous Waste From Developed to Developing Nations” 643 *NJILB* 11 (1990).

²⁹ Preamble of the Basel Convention, 1989

³⁰ Basel Convention, 1989

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written consent from transit states and the state of import .Information must be supplied which is sufficient tenable the nature and effects on health and the environment of the proposed movement to be assessed.³¹

There are two ways in which the requirement of prior informed consent is enforced. The first is by making the state of export accept the return of illegal waste where practicable or, where the importer is at fault, imposing on the state of import a duty to ensure safe disposal of the waste.³²

The second method employed by the Basel Convention is to ensure that states punish illegal traffic as a criminal offence. The requirement of prior consent, as we have seen, is simply an expression of the sovereignty of a state over the use of its territory and resources.

The primary obligation imposed by the Basel Convention is to manage the trans-boundary movement of waste in an environmentally sound manner. This obligation applies to exporting, transit, and importing states alike, and also to trade with non-parties, which may only be conducted under an agreement providing for management no less environmentally sound than is required by the convention. The crucial point is that states must not permit export or import of waste if they believe that it will not be handled in an environmentally sound manner. Developing states do not escape this responsibility for sound management of imported waste; if they cannot meet it, they must either seek assistance, relying on the conventions provisions for international co-operation or prohibit the import.³³

The principal aims of the convention are reiterated, including waste prevention and minimization, least transboundary movement, recycling self-sufficiency and proximity of disposal. Criteria to be used in assessing the soundness of waste-management standards include the following:³⁴

Whether waste sites are authorized and of adequate standard to deal with the waste in question, whether operators of waste sites are adequately trained, whether

³¹ Article 6 of the Basel Convention 1989

³² Article 9 of the Basel Convention 1989

³³ Article 10 of the Basel Convention 1989

³⁴ Basel Convention 1989

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sites are monitored, and whether waste generation is minimized through best practice and clean production methods.

Further development of the convention regime is the responsibility of the conference of the parties established for this purpose. It has power to adopt decisions, amendments, and protocols, and to undertake any additional action required to further the objectives of the convention. The obligatory provisions of information from parties regarding trans-boundary movements, their effects on health and the environment and any accidents during transport or disposal, given the conference a basis on which to review the effectiveness of the convention and the policies of states. In most respect the Basel Convention's provision for international supervision thus follows the typical pattern adopted in many environmental treaties³⁵.

Unusually, the COP has pioneered direct participation by industry as a means of securing agreement on how to handle end-of life electronic equipment such as mobile phones and computers. Several additional functions are given to the secretariat, including assistance in identifying illegal traffic, the role of this body in verifying alleged breaches of obligation under Article 19³⁶ of the convention is confined to relaying 'all relevant information to the parties.

Apart from that the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, 1991³⁷ was adopted by the member-states of the defunct Organisation of Africa Unity (OAU), now African Union (AU), as a protest against the persisting dumping of hazardous and nuclear wastes in the territorial borders of African countries which the Basel Convention was perceived not to have effectively addressed.

Another notable regional treaty related to hazardous wastes the Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous

³⁵ Article 17 of the Basel Convention 1989

³⁶ Basel Convention 1989

³⁷ The Bamako Convention 1991

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Wastes within the South Pacific Region, 1995³⁸. This treaty opened for signature in Waigani, Papua New Guinea, in 1995, and entered into force in 2001.

The national legal framework governing environmental issues focus on specific type of pollution and regulation of hazardous substances. To combat the ever growing E-waste problem, India needs to have strong rules and regulations. Over the years, the government has instituted a number of regulations for better management of hazardous waste in the country. Of late, only in 2006 in exercise of powers conferred under Sections 3, 6 and 25 of the Environment (Protection) Act, 1986 the MoEF has started to draft .The Hazardous Wastes (Management and Handling) Amendment Rules, 2003 under schedule 3; E-waste is to be defined as “Waste Electrical and Electronic Equipment including all components, sub-assemblies and their fractions except batteries falling under these rules”.³⁹ The definition provided here is similar to that of Basal Convention. E-waste is only briefly included in the rules with no detail description. The Guidelines for Environmentally Sound Management of E-Waste, 2008 was a Government of India initiative and was approved by Ministry of Environment and Forest and Central Pollution Control Board. It classified the E-waste according to its various components and compositions and mainly emphasises on the Environment and Forest and Central Pollution Control Board. It classified the E-waste according to its various components and compositions and mainly emphasises on the management and treatment practices of E-waste.

The following rules will come under the Environment (Protection) Act 1986 (EPA). The E-Waste (Management and Handling) Rules, 2011, putting the onus of recycling of electronic wastes on the producers, the Ministry of Environment and Forest has for the first time notified E-waste management rules. The E-waste (management and handling) Rules, 2011 would recognize the producers’ liability for recycling and reducing E-waste in the country. The rules will come into effect from May 1, 2012.⁴⁰ according to this regulation, ‘electrical and electronic equipment’ means equipment which is dependent on electric currents or electro-magnetic fields to be fully functional and ‘E-waste’ means waste electrical and electronic equipment, whole or in part or rejects from their manufacturing and repair process, which are

³⁸ The Waigani Convention 1995

³⁹ The Hazardous Wastes (Management and Handling) Amendment Rules, 2003

⁴⁰ E-waste (Management and Handling) Rules, 2011

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intended to be discarded. these rules are meant to be applied to every producer, consumer or bulk consumer involved in manufacturing, sale purchase and processing of electrical and electronic equipment, collection centres, dismantlers and recyclers of E-waste. Responsibilities of producers, collection centres, consumers, dismantlers, recyclers etc. are defined and incorporated in these rules.⁴¹

And it was again amended in 2015 and finally the E-Waste (Management) Rules, 2016 were passed by the government of India.⁴² These rules are called the E-Waste (Management) Rules, 2016⁴³ which came into force on the 1st day of October, 2016. This new rules have many new and effective provisions. They contain six Chapters and 24 Sections in total and four Schedules respectively. Wherein, Chapter 1 consists of 3 sections in which Section 1 talks about the short title and commencement of the rules. Section 2 talks about the application of the rules which says that these rules shall apply to every manufacturer, producer, consumer, bulk consumer, collection centres, dealers, e-retailer, refurbisher, dismantler and recycler involved in manufacture, sale, transfer, purchase, collection, storage and processing of E-waste. Section 3 is a definition clause where various terms like 'bulk consumer', Central Pollution Control Board, 'consumables', 'channelisation', dismantler, electrical and electronic equipment, E-waste, 'orphaned products', 'refurbisher' etc are defined. Section 4 describes the responsibilities of the manufacturer which is to collect E-waste generated during the manufacture of any electrical and electronic equipment and channelise it for recycling or disposal. Section 5 describes the responsibilities of the producer which says that the producer of electrical and electronic equipment shall be responsible for implementing the Extended Producers Responsibility.⁴⁴

Section 6 talks about Responsibilities of collection centres-which are to collect E-waste on behalf of producer or dismantler or recycler or refurbisher including those arising from orphaned products. Section 7 talks about Responsibilities of dealers which is to collect the e waste by providing the consumer a box, bin or a demarcated area to deposit e waste, or through take back system and send the E-waste so collected

⁴¹ Government of India, guidelines for environmentally Sound Management of e-waste (Ministry of Environment & Forests and Central Pollution Control, Board (2008).

⁴² Shyam Divan and Armin Rosencranz, *Environmental Law and Policy in India: Cases Material and Statutes*. 41 (Oxford University Press, New Delhi, 2002).

⁴³ <http://www.moef.gov.in/sites/default/files/EWM%20Rules%202016%20english%2023.03.2016.pdf> (visited on 10 November 2019).

⁴⁴ E-Waste (Management) Rules, 2016

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to collection centre or dismantler or recycler as designated by producer. Section 8 describes the responsibilities of the refurbisher which is to collect E-waste generated during the process of refurbishing and channelise the waste to authorised dismantler or recycler through its collection centre. Section 9 describes the Responsibilities of consumer or bulk consumer. Section 10 describes the Responsibilities of the dismantler which is to ensure that the facility and dismantling processes are in accordance with the standards or guidelines prescribed by Central Pollution Control Board from time to time. Section 11 describes the Responsibilities of the recycler. Section 12 describes the Responsibilities of State Government for environmentally sound management of E-waste which is to ensure earmarking or allocation of industrial space or shed for E-waste dismantling and recycling in the existing and upcoming industrial park, estate and industrial clusters.

Chapter III of the rules consists of the procedure for seeking and grant of authorisation for management of E-waste in section 13 and 14 respectively. Section 15 consists of Procedure for storage of E-waste which is sub-headed under Chapter IV. Section 16 under chapter V consists of Reduction in the use of hazardous substances in the manufacture of electrical and electronic equipment and their components or consumables or parts or spares. Section 17 talks about the Duties of authorities which are Subject to other provisions of these rules, and duties shall be performed as specified in Schedule IV. Section 18 consists of the Annual Report which is submitted and prepared by Central Pollution Control Board and respective State Pollution Control Board. Section 19 consists of Transportation of E-waste. Section 20 talks about Accident reporting. Section 21 consists of Liability of manufacturer, producer, importer, transporter, refurbisher, dismantler and recycler for all damages caused to the environment or third party due to improper handling and management of the E-waste.

According to Section 22 any person aggrieved by an order of suspension or cancellation or refusal of authorisation or its renewal passed by the Central Pollution Control Board or State Pollution Control Board may, within a period of thirty days from the date on which the order is communicated to him, prefer an appeal in Form 7 to the Appellate Authority comprising of the Environment Secretary of the State. As per Section 23 the collection, storage, transportation, segregation, refurbishment, dismantling, recycling and disposal of E-waste shall be in accordance with the

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procedures prescribed in the guidelines published by the Central Pollution Control Board from time to time.⁴⁵ Under section 24 Urban Local Bodies (Municipal Committee or Council or Corporation) shall ensure that e-waste pertaining to orphan products is collected and channelised to authorised dismantler or recycler.

Later part of these rules contains schedules wherein under Schedule I categories of electrical and electronic equipment are enlisted. Under Schedule II applications which are exempted from the requirements of sub-rule (1) of rule 16 are entertained. Schedule III consists of targets for extended producer responsibility-authorisation. Schedule III contains the list of authorities and corresponding duties.

However, according to the rules, bulk consumers such as enterprises and government will be responsible for recycling of the E-wastes generated by them. The bulk users have to ensure that the E-waste generated by them is channelized to authorized collection centres or is taken back by the producers. They also have to maintain records of E-wastes generated by them and make such records available with State Pollution Control Boards or the Pollution Control Committees. The Environment Ministry must work closely with the States to implement the tighter rules⁴⁶.

2. REVIEW OF LITERATURE

For the purpose of writing research work, the researcher has review the following books and articles-

- **Claus Hieronymi, Ramzy Kahhat and Eric Williams, *E-Waste Management, From Waste to Resource* (Taylar and Francis Group New York, 2013).**

The author examined that a review the landscape of electronic waste, E-waste, management is changing dramatically. Besides a rapidly increasing world population, globalization is driving the demand for products, resulting in rising prices for many materials. Absolute scarcity looms for some special resources such as indium. Used electronic products and recyclable materials are increasingly crisscrossing the globe. This is creating both opportunities and challenges for E-waste management. The book

⁴⁵ The E-waste (Management) Rules, 2016, Rule.21.

⁴⁶ A. Borthakur "Health and environmental hazards of electronic waste in India" 78 *JEH* 8 (2016).

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will focus on the current and future trends, technologies, and regulations for reusable and recyclable E-waste worldwide. It will also compare international E-waste management perspectives and regulations under a view that includes the environmental, social, and economic aspects of the different systems. The mission of this book is to educate consultants, legislators, recyclers, waste managers, manufacturers, and the general public about the future of E-waste. It has been divided in twelve chapters that cover three major themes: (1) a holistic view of the global E-waste situation; (2) the current reserve supply chain and management of used electronics, including flows, solutions, policies, and regulations; and (3) future perspectives and solutions for a sustainable E-waste management. Accordingly, the first Chapter describes the current E-waste scenario around the world and its major environmental, social and economic implications, such as E-waste and landfills, formal and informal recycling, reuse, and their social and economic impacts.

Thus, Chapter 6 introduces the reader to several E-waste management systems in Europe and North America and describes a framework that can be used to compare and evaluate their performance that can be applied in the future to gain insight into their effects on system performance and future improvements. One of the main issues related to the global E-waste situation are the transboundary flows of E-waste, from developed to developing countries, or even between developing countries

Global policies related to transboundary flows of used electronics and their major future challenges and recommendations are discussed in Chapter 8 the future of E-waste management is analysed in the following chapters. The future legal development of electronic products and its management is discussed in Chapter 9 Chapter 10 gives an overview of some of the most important sustainability issues facing the electronics sector including energy, climate change, materials and E-waste, and examines how these environmental and social concerns are converging with core business matters.

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- **Rakesh Johri, *E-Waste: Implications, Regulations, and Management in India and Current Global Best Practices* (Energy and Resources Institute Ltd., 2013).**

The author examined that a review E- waste regulation India and International status E-waste legislation in the European Union and the Basel Convention regulating E-waste, and also a review of the international and national legal framework on E-waste extended producer responsibility, and international rules and regulations on E-waste recycling technology for E-waste optimal planning for computer waste recycling of e-scrap in a global environment, opportunities and challenges technologies for recovery of resources from E-waste CPCB draft guideline for environmentally sound management of E-waste.

- **Bruce Fowler, *Electronic Waste: Toxicology and Public Health Issues*” (Academic Press London, 2017).**

This book discusses the major public health concerns due to the presence of toxic chemicals that are generated from improper recycling and disposal practices of electronic waste. This book highlights hazardous inorganic chemicals found in E-waste, including arsenic, cadmium, lead, mercury, gallium, iridium, and nano materials, also focusing on health issues related to the presence of BPA, styrene, and other plastic components and combustion products, while also identifying populations at special risk.

To provide readers with potential solutions to this global problem, the author presents risk assessment approaches using chemicals, mixtures, biomarkers, susceptibility factors, and computational toxicology. He discusses how to translate the information gathered through risk assessment into safe and effective international policies.

The final chapter is devoted to future research directions. This is a timely and useful resource for all those concerned with the health issues surrounding E-waste management and proper disposal, including toxicologists, public health and policy officials, environmental scientists, and risk assessors.

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This book highlights Emphasizes the transference of electronic wasteto developing countries where populations of concern include children working in recycling activities and impoverished groups with poor nutritional status and limited access to medical resources.

- **Rajya Sabha Secretariat “E-Waste in India” *Research Unit*, New Delhi (2012)**

This Article highlights a brief insight into this relatively new concept of E-waste, its generation in India and the environmental and health concerns attached to it. It highlights the E-waste recycling economy in the thriving informal and the nascent formal sector and the urgent need for a more clear-cut legislation and forward looking vision. It highlights also the revolutionary changes experienced in societies across the world due to the application of electronics are far more deep and widespread than the impact of industrial revolution. The electronics age made unprecedented impact on human society and spectacularly enhanced our connectivity across the globe. The widespread use of electronic items has made communication easier, boosted business activities and created employment opportunities. However, along with the benefits, it has brought into focus many challenges, like the rising problem of E-waste, that have to be boldly dealt with by society. In the current scenario, it is always possible that human health and environment would be drastically endangered if concerted legislations and actions were not taken for efficient management and disposal of E-waste. The Article also looks into the global trade in E-waste and the international experience in this regard.

- **Santhanam Needhidasan, “Electronic Waste an Emerging Threat to the Environment of Urban India” *JESHE* (2014).**

This article focuses on the problem of E-waste along with its policy level implications, and that there is an urgent need to address the issues related to E-waste in India in order to avoid its detrimental future consequences.

The use of Information and Communication Technology cannot be ignored and dispensed with in the contemporary era and the same requires a sound and effective strategy as well. The benefits of ICT are also accompanied with certain drawbacks and nuisances that, if ignored, may be a big threat to India’s environment. The ICT

strategy of India must consider these aspects on a priority basis and the same must be an indispensable part and parcel of the Indian e-governance plan.

- **Monika and Jugal Kishore, “E-Waste Management: As a Challenge to Public Health in India” *IJCM* (2010).**

This article focuses on the problem of E-waste and environmental epidemiological studies are required to assess the present status of E-waste management system in India, to assess the E-waste quantities and exact amplitude of the problem in Indian cities, and to establish relationships with the informal recycling sectors. The valuable data will be generated by these studies that would help in drafting an action plan for E-waste management. India should start a surveillance system for diseases and health consequences of E-waste. The sustainability of E-waste management systems has to be ensured by improving the collection and recycling systems. It would be desirable to establish public-private partnerships in setting up buy-back or drop-off centers. Levying advance recycling fees is another approach to ensure waste management sustainability.

1.2. STATEMENT OF PROBLEM

Developing countries are facing enormous challenges related to the generation and management of E-waste which are either internally generated or imported illegally; India is no exception to it. However, the existing management practices related to E-waste in India are reasonably poor and have the potential to risk both human health and the environment. Keeping in view the above E-waste problem the government of India in exercise of powers conferred under Sections 3, 6 and 25 of the EPA ct, 1986 had codified *Hazardous Waste (Management and Handling) Rules, 1989* and *Hazardous Waste (Storage Export and Import) Rules, 1989* to regulate the dangerous dimensions of hazardous waste in India. For the first time the MoEF has started to draft the *Waste Electronic and Electrical Equipment Rules began in 2006* as a corollary to the *Hazardous Waste Management and Handling Rules, 1989*. Subsequently, *Guidelines for Environmentally Sound Management of E-waste, 2008* and *E-Waste (Management and Handling) Rules, 2011* were issued to deal the problems of E-Waste. More recently, Government of India notified a rule on E-Waste in the form of “*E-waste (Management and Handling) Rules, 2016*”. Electric and electronic equipment especially computer content toxic and heavy metals with

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information technological development generates E- waste in a huge amount. This waste contents material such as lead, mercury, cadmium and plastic that cause toxic pollution if it inadequately disposed of. There are several methods to disposed E-waste either by landfill or incinerator or recycle or exporting. However, all this method will give negative impact to human health and environment, other than that problem related to facilities and location of E-waste disposal is occurring. For instances, in a landfill method of the E-waste, it will contaminate groundwater and if we incinerate E-waste, it will produce hazardous smelt and left hazardous residue.

The management practices of E-waste are poorly designed in India and caused a serious human health and environmental issues. Further, the Involvement of urban poor and illegally imported E-waste from developed countries exaggerate the problem of E-waste. Moreover, the lack of public awareness regarding the disposal of electronic goods and inadequacy of policies to handle the issues related to E-waste enhance the problem in India. Therefore, the proper implementation of the “*E-waste Rules, 2016*” is necessary to address the ever growing pile of E-waste in the country. In India, we need to enact a strong and comprehensive legislation on E-waste management in order to ensure that it would not harm to environment in general and man in particular. It is also the responsibility of everyone including individuals and corporate bodies, to help the Government reduce waste through recycling.

1.3. OBJECTIVES OF RESEARCH

The purpose of this research is to examine the law and policy on E-waste management in India, in order to develop a framework for sustainable E- waste management regime in future. In this context the following objectives of research are as under:

1. To explore the various sources of E-waste.
2. To analyse the International Legal Framework relating to E-waste management.
3. To analyse the adverse effects of E-waste on human health and environment.
4. To analyse the implementation of laws towards E-waste management.
5. To assess the role of Judiciary, Pollution Control Boards and National Green Tribunal in the regulation of E-waste management in India.
6. To suggest the effective measures for the E-waste management.

1.4. HYPOTHESIS

1. The available international and national level legal regime is not sufficient for the proper E-waste management.
2. The implementation of available regulations relating to management of E-waste is not effective.
3. There is a lack of accurate figure of E-waste volumes generated domestically and by imports.
4. There is lack of awareness among people about the adverse effect of E-waste on human health and environment.

1.5. RESEARCH METHODOLOGY

The methodology of the research shall be primarily doctrinal by using and secondary sources. The various conventions, resolution, authoritative text books, International Law Journals, report, gazette, judicial pronouncement and various articles of national and international authors will be referred by the researcher to critically analysed to the substantiate logic and rational behind the different provisions relating to the legal framework on E-waste management.

1.6. FRAMEWORK OF THE STUDY

For the systematic, smooth and purposeful study the entire research work has been broadly divided into seven chapters.

CHAPTER- I –INTRODUCTION

The first is an introduction to various concepts relating to the research work. It includes statement of problem, objectives of the study, hypothesis and research methodology of the research work.

CHAPTER II - E- WASTE: MEANING AND CONCEPT

This chapter deals with the meaning and concept of e-waste management. According to *Basel action network* the E-waste is defined as “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”. E-waste consists

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of all waste from electrical and electronic equipment's which have reached their end-of-life period or are not in useful condition and it should be either recycle or dispose. It includes computer and its accessories as monitors, printers, keyboards, central processing units; typewriters, mobile phones and chargers, remotes, compact discs, headphones, batteries, LCD/Plasma TVs, air conditioners, refrigerators and other household appliances. The E-waste has diverse compositions that are classified as "hazardous" and "non-hazardous" categories. Broadly, it consists of ferrous and non-ferrous metals, plastics, glass, wood and plywood, printed circuit boards, concrete, ceramics, rubber and other items. Iron and steel constitute about 50% of the waste, followed by plastics (21%), nonferrous metals (13%) and other constituents. Non-ferrous metals consist of metals like copper, aluminium and precious metals like silver, gold, platinum, palladium and so on.

CHAPTER III- INTERNATIONAL LEGAL FRAMEWORK ON E-WASTE MANAGEMENT

In this chapter, I have dealt with the international legal provisions related to E-waste management. Waste electrical and electronic equipment, known also as E-waste, is an emerging waste stream on a global level due to the development of electronic products consumption. It holds great challenges for both industrialized and developing countries. Dismantling activities that are frequently performed in poor conditions give rise to public health issues. Open burning and open dump practices are the worst options usually adopted by countries without a proper legislation and lack of basic waste management services. The illegal dumping practice of Waste electrical and electronic equipments occurs even in developed countries due to the poor environmental law enforcement of local and regional authorities

CHAPTER IV- NATIONAL LEGAL FRAMEWORK ON E-WASTE MANAGEMENT

This Chapter analyses various laws and policies in India, related to electronic waste management, whether in the matter of regulation or enforcement of the law. The Hazardous Wastes (Management and Handling) Rules, 1989, the Hazardous Wastes (Management and Handling) Amendment Rules, 2003, the Municipal Solid Wastes (Management and Handling) Rules, 2000, the Hazardous wastes (Management , Handling and Transboundary Movement) Rules, 2008, the Hazardous

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wastes (Management , Handling and Transboundary Movement) Amendment Rules, 2009, the Hazardous wastes (Management , Handling and Transboundary Movement) Second Amendment Rules, 2009, and the E-waste (Management and Handling) Rules, 2011, the E-waste (Management) Rules, 2015, the E-waste (Management) Rule, 2016 etc.

CHAPTER V- E-WASTE: IMPACT ON HUMAN HEALTH AND ENVIRONMENT

In this chapter, the researcher has discussed the impact of e-waste on human health and environment. E-waste is a growing and emerging global problem because plethora toxic chemicals are released to the environment during dismantling, burning, and recycling processes. Therefore, for this purpose, the current chapter aims to investigate with special emphasis on E-waste associated impacts on the environmental and human health. These enormous quantities in combination with the fact that E-waste contains a wide range of hazardous compounds have turned E-waste into a global environmental issue. When the E-waste is not taken care of appropriately, either in general wastes processes or in recycling processes, these hazardous compounds may be released and thereby become a threat to humans and the environment. In addition, in some processes used, new hazardous compounds, such as dioxins, may be formed as the original E-waste components are degraded. Consequently, to avoid serious impacts on human health and the environment it is crucial to ensure that E-waste is properly taken care of, all the way from collection and handling through recycling and disposal.

CHAPTER VI- E-WASTE MANAGEMENT: ROLE OF JUDICIARY AND POLLUTION CONTROL BOARDS

In this chapter, the researcher has discussed the judicial decisions relating to the E-waste management in India. The judiciary has played a very vital role in protecting the environment and checking its degradation and pollution. It is the judiciary, which introduced the concept of environmental jurisprudence and made continuous serious efforts to make the people aware about the dire consequences of environmental pollution. In India E-waste management law has seen considerable development in the last two decades. In *Toxic link v. Union of India & Others* (2016), the National Green Tribunal held that the, All stakeholders, particularly, the local

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authorities upon whom burden lies to ensure proper collection, segregation, transportation and disposal of solid waste should act in complete coordination and coherence to ensure that the country tackles this menace of E-waste management, objectively, effectively and ensures that there is no pollution of the environment and consequent adverse impacts on public health.

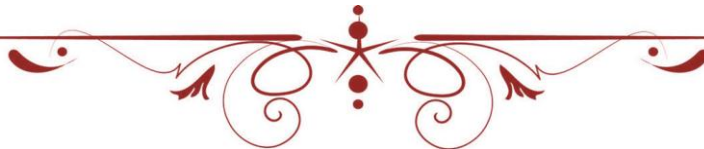
CHAPTER VII- CONCLUSION AND SUGGESTIONS

In this chapter, on the basis of the study the conclusion and suggestions are drawn for improvement of the legal framework on E -waste management.



CHAPTER-II

ELECTRONIC WASTE (E-WASTE): MEANING AND CONCEPT



CHAPTER-II

ELECTRONIC WASTE (E-WASTE): MEANING AND CONCEPT

2.1. INTRODUCTION

The rapid growth of technology, upgradation of technical innovations and a high rate of obsolescence in the electronics industry have led to one of the fastest growing waste streams in the world which consist of end of life electrical and electronic equipment products. It comprises a whole range of electrical and electronic items such as refrigerators, washing machines, computers and printers, televisions, mobiles, i-pods, etc., many of which contain toxic materials. Many of the trends in consumption and production processes are unsustainable and pose serious challenge to environment and human health. Optimal and efficient use of natural resources, minimization of waste, development of cleaner products and environmentally sustainable recycling and disposal of waste are some of the issues which need to be addressed by all concerned while ensuring the economic growth and enhancing the quality of life.¹

Every year tons of electronic items are shipped over oceans, however, after their usage time they are become a complex waste matter which consists of many hazardous heavy metals, acids, toxic chemicals and non degradable plastics. Many are dumped, burnt or exported to recyclers. However, about 75% of E-wastes are uncertain for their use or finding ways to use them which include refurbishment, remanufacture and reuse their parts for repair etc.² E-waste contains hazardous substances that, if treated inappropriately at end-of-life, can damage human health and the environment. It also contains complex valuable materials, such as precious metals

¹ Rakesh Johri, *E-waste: Implications, Regulations and Management in India and Current Global Best Practices*, 50 (The Energy and Resources Institute, 2008).

² B.S. Devi, and S.V. Shobha, et.al. "E-Waste: The Hidden Harm of Technological Revolution". 196-205 *J IAEM* 31 (2004).

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which need to be treated properly to effectively recover them with minimal environmental impact.³

In this chapter, the researcher has analysed the meaning and concept of E-waste in given context to understand the nature and composition of electronic waste which will help to administer for making legal measures for better management of E-waste.

2.2. MEANING AND CONCEPT OF E-WASTE

Like hazardous waste, the problem of E-waste has become an immediate and long term concern as its unregulated accumulation and recycling can lead to major environmental problems endangering human health. The information technology has revolutionized the way we live, work and communicates bringing countless benefits and wealth to all its users. The creation of innovative and new technologies and the globalization of the economy have made a whole range of products available and affordable to the people changing their lifestyles significantly. New electronic products have become an integral part of our daily lives providing us with more comfort, security, easy and faster acquisition and exchange of information. But on the other hand, it has also led to unrestrained resource consumption and an alarming waste generation. Both developed countries and developing countries like India face the problem of E-waste management⁴.

While generally does not have meaning or clear definition. But, it has provided a definition extensively that is the electrical and electronic equipment which are used as household appliances as durable or electrical equipment for data processing, communications, entertainment for family or household or business. The discarded and end-of-life electronics products ranging from computers, equipment used in Information and Communication Technology (ICT), home appliances, audio and video products and all of their peripherals are popularly known as Electronic waste (E-Waste).⁵

³³H.Y. Kang and J.M. Schocnung, "Electronic waste: A review of US infrastructure and technology Options" 45 *RCR* 368 (2005).

⁴ Rajya Sabha Secretariat "*E-Waste in India*" 8 New Delhi (2012)

⁵ H.Y. Kang and J.M. Schocnung, "Electronic waste: A review of US infrastructure and technology Options" 45 *RCR* 368 (2005).

2.3. DEFINITION OF E-WASTE

Due to the speedy advancements in technology at every single breath we take, it becomes very difficult to give a very precise definition of 'E-waste' as it could range from the most uncommon thing to the most common thing we use in our daily life cycle.

Waste refers to anything that is no longer privately valued by its owner or has reached its end-of-life. One of the major issues related to E-waste is that there is no standard definition of WEEE/E-waste. A number of international institutions and countries have come out with their own definitions, interpretation and usage of the term "E-waste/WEEE".

A. ACCORDING TO THE BASEL CONVENTION

The Basel Convention has identified as a hazardous waste with this type of electronic waste or technology waste or WEEE is also included Waste under the provisions of the convention.

The waste is a "Hazardous waste"⁶ as defined in Annex 1 total of includes 45 categories, which are hazardous as defined in Annex 3, such as explosive, flammable, combustible themselves or be a flammable gas on contact with water, oxidized zinc toxic, corrosive or infection etc. Later, it has developed a list of hazardous waste to be more clear.

As defined in Annex 8 called List A, which was classified into four major categories, a total of fifteen types, include metal wastes, such as antimony, arsenic, beryllium, cadmium, lead, mercury, batteries, and precious metal ashes from the incineration of electronic circuits etc. A waste which have inorganic to be mainly elements, such as glass from glass tubes, catalysts, asbestos, dust etc. And fibers, which have organic to be mainly elements, such as crude oil waste is caused by a oil refinery or refining of mineral, oil, leather scrap or composition of leather, etc.⁷

And a waste, which has inorganic and organic to be mainly elements, such as a waste is caused by the preparing or the production of pharmaceutical products, a

⁶ Available At: www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf (Visited on 15 Feb. 2020).

⁷ Article 3 Basel Convention 1989

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waste is caused by treatment, ink, oil paint, pesticides, etc. Moreover, there is also a set of waste in Annex 9 or List B, which is not considered as a hazardous waste unless there is material in Annex 1 to be a lot of elements which is able to display properties in Annex 3, a total of 53 types, such as scrap iron and steel, scraps of copper, scraps of nickel, scraps of antimony, scraps of cadmium and parts of electrical equipment and electronic appliance, etc.

ii) Other Waste as defined in Annex 2 that is waste from households and residues from the incineration of waste from households.⁸

So, the determination of the Basel Convention on Hazardous Waste Annex, it can be adapted for use as electronic waste from the list because it has set a certain type of objects that look into the category of electronic waste in Annex 3. Because such a electronic appliance and component have a composition that to be an object contaminated with hazardous waste. Such a technology waste transportation must comply with the terms of obligations under the Basel Convention also.

Basel Convention covers all discarded/disposed materials that possess hazardous characteristics as well as all wastes considered hazardous on a national basis. Annexure VIII refers to E-waste, which is considered hazardous under Article 1, Para. 1(a) of the Convention: A11801⁹ Waste electrical and electronic assemblies or scrap containing components such as accumulators and other batteries included on list A, mercury-switches, glass from cathode-ray tubes and other activated glass and PCB-capacitors, or contaminated with Annexure I constituents (e.g., cadmium, mercury, lead, polychlorinated biphenyl) to an extent that they possess any of the characteristics contained in Annexure III. Annexure IX contains the mirror entry, B11102¹⁰ Electrical and Electronic assemblies given below:

- Electronic assemblies consisting only of metals or alloys.
- Waste electrical and electronic assemblies or scrap (including printed circuit boards) not containing components such as accumulators and other batteries included on List

⁸ Basel Convention Action Network 2005

⁹ Basel no. A1180 of Basel Convention, 1992

¹⁰ Basel no. B1110 of Basel Convention, 1992

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A, mercury switches, glass from cathode-ray tubes and other activated glass and printed circuit board capacitors, or not contaminated with Annexure1.¹¹

B. ACCORDING TO THE EUROPEAN UNION

The most widely accepted definition and description of WEEE/E-waste is as per the European Union directive. The Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) cover all electrical and electronic equipment used by consumers. For the purposes of this Directive, following definitions are applied:¹²

Article 3(a) of WEEE Directive (EU 2002) defined ‘electrical and electronic equipment’ means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in Annexure IA and designed for use with a voltage rating not exceeding 1000 Volt for alternating current and 1500 Volt for direct current;

Article 3(b) defines ‘waste electrical and electronic equipment’ means electrical or electronic equipment which is waste within the meaning of Article 1(a) of Directive 75/442/EEC, “E-waste encompasses a broad and growing range of electronic devices ranging from large household devices such as refrigerators, air conditioners, cell phones, personal stereos, and consumer electronics to computers which have been discarded by their users.”¹³

Categories of electrical and electronic equipment covered by this Directive within Annexure IA are as follows:

1. Large household appliances
2. Small household appliances
3. IT and telecommunications equipment

¹¹ BaselConvention1989, Available at: <http://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionTexte.pdf>, (visited on march 5, 2020).

¹² European Union WEEE Directive 2002/96/EC, Available at: [www. http://ec.europa.eu/environment/waste/weee/index_en.htm](http://ec.europa.eu/environment/waste/weee/index_en.htm) (visited on March 6, 2020).

¹³ *Ibid*

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4. Consumer equipment
5. Lighting equipment
6. Electrical and electronic tools (with the exception of large-scale stationary industrial tools)
7. Toys, leisure and sports equipment
8. Medical devices (with the exception of all implanted and infected products)
9. Monitoring and control instruments
10. Automatic dispensers

C. ACCORDING TO THE SASKATCHEWAN

Under rule 2 (f) of “The Waste Electronic Equipment Regulations, 2010” defines WEEE/E-waste as “waste electronic equipment”, which means electronic equipment that the consumer no longer wants.

Rule 2 (b) defines ‘Electronic Equipment’ as any electronic equipment listed in Column 1 of Table 1 of these regulations. This table includes following electronic equipment,¹⁴

1. Personal desktop computer, including the central processing unit and all other parts contained in the computer
2. Personal notebook computer, including the central processing unit and all other parts contained in the computer.
3. Computer monitor, including cathode ray tube, liquid crystal display and plasma,
4. Computer mouse, including cables Computer printer including dot matrix; ink jet; laser; thermal and computer printer with scanning or facsimile capabilities or both. Television (cathode ray tube, liquid crystal display, plasma and rear projection)

¹⁴ The Electronic Equipment Stewardship Regulations 2010, Available at: <http://www.recyclemyelectronics.ca/sk/wp-content/uploads/2013/05/SK-WASTE-ELECTRONIC-EQUIPREGS.pdf>, (visited on Jan. 12, 2020).

D. ACCORDING TO THE SOLVING THE E-WASTE PROBLEM (STEP)

StEP is an international initiative that works on developing solution for the E-waste issue around the world. According to StEP, “E-Waste is a term used to cover items of all types of electrical and electronic equipment and its parts that have been discarded by the owner as waste without the intention of re-use.”¹⁵

E. ACCORDING TO THE UNEP

The United Nations Environment Program (UNEP) and Organization for Economic Cooperation and Development (OECD) put forth the shortest and the most exhaustive definitions so far. UNEP defines ‘E-waste’ as “any electrically powered appliance that fails to satisfy the current owner for its originally intended purpose” and for OECD, “any household appliance consuming electricity that has reached its end of life is E-waste.” The use of the word ‘any’ in the definitions makes them very extensive, practical and suitable for the needs of the present as well as future because it is open to interpretation and is too broad to include anything and everything that uses electricity.

F. ACCORDING TO THE JAPAN

There is no specific definition of WEEE/ E-waste as defined in Japan. E-waste is covered under laws to promote recycling with in Japan. The two major laws covering broad range of E-waste items are “The Law for Recycling of Specified Kinds of Home Appliances (Home Appliances Recycling Law)” enacted in 1998 and “The Law for Promotion of the Effective Utilization of Resources” enacted in 2000.

In “The Law for Recycling of Specified Kinds of Home Appliances (Home Appliances Recycling Law)”, E-waste is referred as “Used Consumer Electric Goods Discarded by Consumer.” This law covers Televisions, Refrigerators, Washing Machines, Air Conditioners and other objects of similar nature.¹⁶

In “The Law for Promotion of the Effective Utilization of Resources”, E-waste is covered under “Used goods and by-products” which have been generated and their large part is discarded. This law covers personal computers (home and office) and

¹⁵ Available at: <http://www.step-initiative.org/>, (visited on March 25, 2020).

¹⁶ The Law for Recycling of Specified Kinds of Home Appliances (Home Appliances Recycling Law) 1998, Available at: <https://www.env.go.jp/en/laws/recycle/08.pdf>, (last visited on Feb. 12, 2020).

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other electronic items. According to this law “Used goods” means any articles that are collected, used or unused, or is disposed of (except radioactive materials or those contaminated thereby). “By product” means any articles obtained secondarily in the process of manufacturing, processing, repair or sale of the product; in the process of supply of energy; or in the process of construction pertaining to architecture and civil engineering (hereinafter referred to as “construction work”) except radioactive materials or those contaminated thereby.¹⁷

G. ACCORDING TO THE GERMANY

The Electrical and Electronic Equipment Act (Elektro G) has put into effect the European WEEE directive into German law since 2005 and regulates the market, the return and the environmentally friendly disposal of electrical and electronic equipment.

Its primary purpose is to reduce waste electrical and electronic equipment, to reuse and recycle it. In addition, the use of pollutants in the devices is to be mitigated. The law thus makes a significant contribution to conserving natural resources and reducing pollutant emissions.

Section 3 (1) Elektro G provides the definition of electrical devices:¹⁸

Your products are electrical devices if they are designed for operation with an alternating voltage of at most 1,000 volts or direct voltage of at most 1,500 volts and are dependent on their proper operation on electric currents or electromagnetic fields or the generation, transmission and measurement of electric currents and electromagnetic fields to serve.

Electrical devices according to the Elektro G are always only end devices, i.e. “finished” products; these fulfill an independent function, are intended for use or installation by end users and can in principle also be installed without great technical effort, even if they are technically qualified.

¹⁷ The Law for Promotion of the Effective Utilization of Resources 2000, Available at: http://www.unep.or.jp/ietc/Publications/spc/EWasteManual_Vol1.pdf (last visited on Feb.25, 2020).

¹⁸ Available at: <https://www.elektrog.de/> (visited on March 27, 2020).

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In contrast, bare components are not covered by the law. Kits fall within the scope if they are placed on the market for the end user and an electrical device can be assembled from them, which in turn falls within the scope.

H. ACCORDING TO THE CANADA

The Government of Canada defines E-waste in 'Guideline for the Disposal of Federal Surplus Electronic and Electrical Equipment' as 'surplus electronic and electrical equipment that is not suitable for reuse'. Electronic and electrical equipment includes 'any equipment with a plug, battery or that uses electricity to perform its intended function' excluding vehicles and vehicle parts. Electronic assets are considered surplus when they have reached the end of their intended useful life and can no longer be reallocated within a department.¹⁹

I. ACCORDING TO THE CHINA

There is no specific definition of WEEE/E-waste in the regulatory system of China. E-waste is covered under 'Management Methods for Controlling Pollution Caused by Electronic Information Products Regulation' referred commonly as "China RoHS" promulgated on 28 February 2006, and effective from 1 March 2007. E-waste is covered under the term "control and reduce" pollution to the environment caused after disposal of Electronic Information Products.²⁰

J. ACCORDING TO THE INDIA

In India before the E-waste (Management and Handling) Rules, 2016, E-waste was covered in Schedule 3 of "The Hazardous Wastes (Management and Handling) Rules, 2011". Under Schedule 3, E-waste was defined as "Waste Electrical and Electronic Equipment including all components, subassemblies and their fractions except batteries falling under these rules." As per Guidelines of Environmentally Sound Management for E-waste 2008 formulated by the Ministry of Environment and Forest, Government of India, E-waste comprises of wastes generated from used electronic devices and house hold appliances which are not fit for their original

¹⁹ Sustainable Buildings Policy (100) PWGSC Departmental Policy Instruments, Available at: <http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/dechets-waste/dechets-wasteeng.html>, (last visited on Jan. 12, 2020).

²⁰ Available at: http://www.unep.or.jp/ietc/Publications/spc/EWasteManual_Vol11.pdf, (last visited on Feb.25, 2020).

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intended use and are destined for recovery, recycling or disposal. Such wastes encompasses wide range of electrical and electronic devices such as computers, hand held cellular phones, personal stereos, including large household appliances such as refrigerators, air conditioners etc.

According to section 3(p) defines ‘electrical and electronic equipment’ means equipment which are dependent on electric current or electro-magnetic field in order to become function.²¹

And section 3(r) defines ‘means 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.’²²

The issuance of such requirements, we have seen that type of equipment or parts thereof in 7 categories that is to be with the scope or meaning of the electronic waste as well (Some unique to a specific directive), Types of management actions, organizations or agencies related to public relations. And sorting can be performed as well as the use of different measures out of control and eradication.

An analysis of above indicates that there are three major pointers to understand the definition of WEEE/E-waste. These are definitions of “electrical and electronic equipment” loss of utility and way of disposal, loss of utility indicates variation in consumer behaviour, while way of disposal broadly reflects different national policies and regulations for considering waste as pollutant or a resource. The most widely accepted definition of WEEE/E-waste is as per the EU directive. The major features of this definition include definition of “electrical and electronic equipment”, its classification into ten categories and its extent as per voltage rating of 1000 volts for alternating current and 1500 volts for direct current. Electrical and electronic equipment have been further classified into components, sub-assemblies and consumables.²³ In other countries, the evolution of WEEE/E-waste definition started with disposal of computers and televisions where CRT disposal was a major environmental concern.

²¹ E-waste (Management and Handling) Rules, 2016.

²² E-waste (Management and Handling) Rules, 2016.

²³ Available at: <http://eur-lex.europa.eu/legal content/EN/TXT/PDF/?uri=CELEX:32012L0019&fromEN> (visited on March 21, 2019).

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Therefore, computers and televisions were included into coverage of electronic equipment with amendments expected to include other items in future. In some definitions, the words product and assemblies or the phrase product and components are mentioned in place of equipment. The words discarded, end of life and dispose/ disposal are invariably used in all definitions to describe loss of utility of electrical and electronic equipment. Similarly, words/ phrases used goods; scrap and waste are invariably used to describe way of disposal. These words are being used to harmonize WEEE/E-waste with least disturbance to existing policies/regulations, where sometimes it is treated separately or under hazardous or solid waste management.

2.4. COMPONENTS OF E-WASTE

E-waste consists of all waste from electronic and electrical appliances which have reached their end- of- life period or are no longer fit for their original intended use and are destined for recovery, recycling or disposal.

Composition of E-waste is very diverse and differs in products across different categories. It contains more than 1000 different substances, which fall under “hazardous” and “non-hazardous” categories. Broadly, it consists of ferrous and non-ferrous metals, plastics, glass, wood & plywood, printed circuit boards, concrete and ceramics, rubber, monitors, printers, keyboards, central processing units; typewriters, mobile phones and chargers, remotes, compact discs, headphones, batteries, liquid crystal display/Plasma television, air conditioners, refrigerators and other household appliances. Iron and steel constitutes about 50% of the E-waste followed by plastics (21%), non ferrous metals (13%) and other constituents. Non-ferrous metals consist of metals like copper, aluminium and precious metals ex. silver, gold, platinum, palladium etc²⁴.

The presence of elements like lead, mercury, arsenic, cadmium, selenium, and hexavalent chromium and flame retardants beyond threshold quantities in E-waste classifies them as hazardous waste. The kinds of components, which are found in

²⁴Rajya Sabha Secretariat “E-Waste in India” 3 New Delhi (2012).

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Refrigerator, Washing Machine, Personal Computers and Television, are described in table 1. The observations from the analysis of table 1 are given below.²⁵

- 1.** Radioactive substances, refractory ceramic fibers, electrolyte capacitors (over L/D 25 mm), textile and magnetron are not present in any item.
- 2.** Plastic, circuit board and external electric cables are present in majority of items. BFR containing plastic is present in refrigerator, laptop and television.
- 3.** Refrigerators are unique items because of presence of CFC/HCFC/HFC/HC, cooling, insulation, incandescent lamp and compressor.
- 4.** Heating element is found in washing machine, while thermostat is found in both refrigerator and washing machine.
- 5.** Fluorescent lamp is found only in laptop.
- 6.** Metal and motor are found in majority of items except refrigerator.
- 7.** Transformer is not found in washing machine and refrigerator.
- 8.** CRT is found in personal computer and TV, while LCD is found in PC and TV.
- 9.** Batteries are found in PC and laptop.
- 10.** Concrete is found in washing machine.
- 11.** Rubber is found in refrigerator and washing machine.
- 12.** Wiring/Electrical is found in all the items.

²⁵ “Report on assessment of electronic wastes in mumba-pune area”, MPCB, March (2007). Available at: <http://mpcb.mah.nic.in> (visited On Jan. 10, 2019).

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Table1: Components in WEEE²⁶

	Refrigerator	Washing Machine	Personal Computer	Monitor	Laptop	Television
Metal	■	■	■			
Motor	■	■	■			■
Cooling	■					
Plastic	■	■	■	■		■
Insulation	■					
Glass	■	■				
CRT				■		
Liquid Crystal Display				■		■
Rubber	■	■				
Wiring Electrical	■	■	■			■
Concrete		■				
Transformer			■			■
Magnetron						
Textile						
Circuit Board		■	■	■		■
Fluorescent lamp	■					■
Incandescent lamp						
Heating element		■				
Thermostat	■	■				
BFR – containing plastic	■					■
Batteries			■			■
CFC, HCFC, HFC, HC	■					
External electric cables	■	■	■	■		■
Refractory ceramic fibers			□			
Radioactive substances					□	
Electrolyte Capacitors		□				

■ Present as a component , □ Possible presence as a component,

²⁶ Management Of E-Waste,2017,“Guidelines For Environmentally Sound” Available at: http://cpcb.nic.in/upload/Latest/Latest_71_ImplementationOf E-WasteRules.pdf, (last visited on Jan.10, 2020).

2.5. EXTENDED PRODUCER RESPONSIBILITY (EPR)

In the field of waste management, extended producer responsibility (EPR) is a strategy to add all of the environmental costs associated with a product throughout the product life cycle to the market price of that product. Extended producer responsibility legislation is a driving force behind the adoption of remanufacturing initiatives because it “focuses on the end-of-use treatment of consumer products and has the primary aim to increase the amount and degree of product recovery and to minimize the environmental impact of waste materials”.

The concept was first formally introduced in Sweden by Thomas Lindhqvist in a 1990 report to the Swedish Ministry of the Environment. In subsequent reports prepared for the Ministry, the following definition emerged: “EPR is an environmental protection strategy to reach an environmental objective of a decreased total environmental impact of a product, by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal of the product. Passing responsibility to producers as polluters is not only a matter of environmental policy, but also the most effective means of achieving higher environmental standards in product design. The Extended Producer Responsibility is implemented through administrative, economic and informative instruments. The composition of these instruments determines the precise form of the Extended Producer Responsibility.”²⁷

The revised definition describes EPR thus: “Extended Producer Responsibility (EPR) is a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling and final disposal of the product”.²⁸

EPR is a notion or concepts that make producers take responsible for their activities not only in production and distribution of goods but also towards the safe disposal of such products. The underlying assumption here is that the stakeholders along the product chain are expected to share responsibility for the entire lifecycle

²⁷Thomas Lindhqvist “Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems” 37 *IIIEE*, Lund University,(2000).

Available at: <https://lup.lub.lu.se/search/ws/files/4433708/1002025.pdf>

²⁸*Ibid*

impacts of products. EPR releases consumer's responsibilities in collection and the proper treatment of E-waste. The mentioned responsibilities are shifted to the producers. Under the EPR ambit, the manufacturers could be liable to collect back and properly recycle the returned Electrical and Electronic Equipment (EEE) products. The implementation of EPR requires the support from international and regional agencies due to cross-border issues.²⁹

2.6. RECYCLING TECHNOLOGIES

There are two significant recycling technologies of E-waste - hazardous and non-hazardous technologies. The informal ways of disposal which result in exposing environment to the hazardous substances is appropriately named as hazardous Technologies or methods. And the technology which safeguards the environment and does not release harmful substances to the environment are named as non-hazardous technology.

A. HAZARDOUS TECHNOLOGIES

The technology Includes incineration, open burning and land filling methods. It is widely used for the disposal of the E-waste in the developing and under developed countries due to its low operative cost and fast returns.

1. INCINERATION

Incineration is the process of destroying waste through burning. Because of a variety of sub stances found in E-waste, incineration is associated with a major risk of generating and dispersing contaminants and toxic substances. The gases released during the burning and the residue ash is often toxic. This is especially true for incineration or co- incineration of E-waste with neither prior treatment nor sophisticated flue gas purification.³⁰

Studies of municipal solid waste incineration plants have shown that copper, which is present in printed circuit boards and cables, acts as a catalyst for dioxin formation when flame-retardants are incinerated. These brominated flame-retardants

²⁹ Atalay Atasu Ravi Subramanian "Extended Producer Responsibility for E-Waste: Individual or Collective Producer Responsibility" 8 POM 21 (2012).

³⁰ Satish Sinha, *E-waste Tamil Nadu Braces up for The Challenge* 18 (Toxic Links New Delhi 2012).

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when exposed to low temperature (600-800°C) can generate extremely toxic polybrominated dioxins (PBDDs) and furans (PBDFs). PVC, which is found in E-waste in significant amounts, is highly corrosive when burnt and also induces the formation of dioxins. Its incineration also leads to the loss of valuable elements that can be recovered if sorted and processed separately.³¹

2. OPEN BURNING

Since open fires burn at relatively low temperatures, its use for waste disposal is far more polluting than controlled incineration process. Inhalation of open fire emissions can trigger asthma attacks, respiratory infections, and cause other problems such as coughing, wheezing, chest pain and eye irritation. Chronic exposure to open fire emissions may lead to diseases such as emphysema and cancer. For example, open air burning of PVC releases hydrogen chloride, which on inhalation mixes with water in the lungs to form hydrochloric acid. This can lead to corrosion of the lung tissues and several respiratory complications. Often open fires burn with a lack of oxygen, forming carbon monoxide, which poisons the blood when inhaled. The residual ash becomes airborne, and is dangerous if inhaled.³²

3. LAND FILLING

Land filling is one of the most widely used methods of waste disposal. It is also common knowledge that all landfills leak. The leachate often contains heavy metals and other toxic substances that contaminate groundwater resources. Even state-of-the-art landfills, which are sealed to prevent toxins from entering the ground, are not completely tight in the long-term. Older landfill sites and uncontrolled dumps pose a much greater danger of releasing hazardous emissions. Mercury, cadmium and lead are among the most toxic leachate. Mercury, for example, will leach when certain electronic devices such as circuit breakers are destroyed. Lead is found to leach from broken lead-containing glass, such as the cone glass of cathode ray tubes from TVs and monitors.³³ When brominated flame retarded plastics or plastics containing

³¹D.J. Bagyaraj, *Microbes for Restoration of Degraded Ecosystems* 158 (New India Publishing Agency, New Delhi 2017).

³² D.J. Bagyaraj, *Microbes for Restoration of Degraded Ecosystems*, 158 (New India Publishing Agency, New Delhi 2017).

³³ Alexander Cogut "Open Burning of Waste: A Global Health Disaster" 51 *RRCA* (2016)

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cadmium are land filled, both PBDE and cadmium may leach into soil and groundwater. Similarly, land filled condensers emit hazardous PCBs.³⁴

Besides leaching, vaporisation is also a concern in landfills. For example, volatile compounds such as mercury or its compound dimethylene mercury are released through vaporisation. In addition, landfills are also prone to uncontrolled fires, which can release toxic fumes. Impacts of the landfills can be minimised by conditioning hazardous materials from E-waste separately and land filling only those fractions which cannot be further recycled.³⁵

B. NON-HAZARDOUS RECYCLING TECHNOLOGIES

The Non Hazardous recycling of E-waste comprises three steps; detoxication, shredding and refining.

1. DETOXICATION

The first step of recycling process is the removal of hazardous components from the E-waste in order to avoid contamination of downstream processes in the recycling mechanism. e.g. CRT, bulb, lead etc. The worker is opening the CRT of the desktop monitor, to segregate the toxic components from further processing.³⁶

2. SHREDDING

Mechanical processing is the next step in E-waste treatment. In a large scale industrial operation recyclable materials are separated from hazardous materials. Typical components of a mechanical processing plant are crushing units, shredders, magnetic and eddy-current- and air-separators. The gas emissions are filtered and effluents are treated to minimize environmental impact.³⁷

³⁴ K Josheph “Electronic waste generation and management in an Indian city” 100-105 *JIAEM* 33 (2008).

³⁵ Nguyen Minh Tue et al., “Release of chlorinated, brominated and mixed halogenated dioxin-related compounds to soils from open burning of e-waste in Agbogbloshie (Accra, Ghana)”, 302 *JHM* 152 (2016).

³⁶ Staffan Lundstedt, *Recycling and disposal of electronic waste Health hazards and environmental impacts*, 64 (The Swedish Environmental Protection Agency, 2011).

³⁷ *Ibid*

3. REFINING

The third step in E-waste recycling is refining. Refining of resources in E-waste is possible, and the technical solutions exist to get back raw material with minimal environmental impact. Most of the fractions need to be refined or conditioned in order to be sold as secondary raw materials or to be disposed of in a final disposal site, respectively. During the refining process, materials paid attention are: metals, plastics and glass.³⁸

Environmentally sound recycling of E-waste requires sophisticated technology and processes, which are not only very expensive, but also need specific skills and training for the operation. Proper recycling of complex materials requires the expertise to recognize or determine the presence of hazardous or potentially hazardous constituents as well as desirable constituents (i.e. those with recoverable value), and then apply the company's capabilities and processes to recycle or treat both of these streams. Appropriate air pollution control devices for the fugitive and point source emissions are required.³⁹

2.7. E-WASTE MANAGEMENT STRATEGIES

These are the best option for dealing with E-Wastes is to reduce the volume. Designers should ensure that the product is built for re-use, repair and/or upgradeability. Stress should be laid on use of less toxic, easily recoverable and recyclable materials which can be taken back for refurbishment, remanufacturing, disassembly and reuse. Recycling and reuse of material are the next level of potential options to reduce E-Waste. Recovery of metals, plastic, glass and other materials reduces the magnitude of E-Waste. These options have a potential to conserve the energy and keep the environment free of toxic material that would otherwise have been released. It is high time the manufactures, consumers, regulators, municipal authorities, state governments, and policy makers take up the matter seriously so that the different critical elements depicted to address in an integrated manner.⁴⁰ It is the

³⁸ Ayesha Anam and Anjum Syed "Green Computing: E-waste management through recycling" 1105 *IJSE* Volume 4, Issue 5(2013).

³⁹ Mathias Schluep et al., *Recycling from e-waste to resources* 54 (United Nations Environmental Program (UNEP) and United Nations University, 2009).

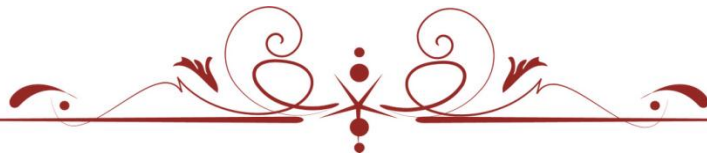
⁴⁰ Yakub Ansari, and Aqueel Ahmad "Effect of Electronic Waste on Environmental and it's Management" 4971 *IJIRSET* (2018).

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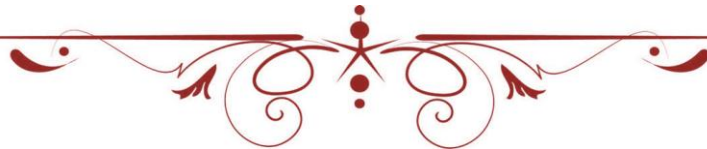
need of time to have an “E-Waste policy” and national regulatory frame work for promotion of such activities. Waste Policy is best created by those who understand the issues. So it is best for industry to initiate policy formation collectively, but with user involvement. Sustainability of E-Waste management systems has to be ensured by improving the effectiveness of collection and recycling systems (e.g., public-private-partnerships in setting up buy-back or drop-off centers) and by designing-in additional finding.

2.8. CONCLUSION

Due to the speedy advancements in technology at every single breath we take, it becomes very difficult to give a very precise definition of ‘E-waste’ as it could range from the most uncommon thing to the most common thing we use in our daily life cycle. Even then several definitions have been proposed so far. However, the potential use of this term has been made more complex because the point at which EEE becomes waste is often viewed subjectively. For the purpose of proper management of E-waste, it is quite necessary that we should understand about various types of E-waste. When we classified area of E- waste, then we able to make legal measured for better management of E- waste. This chapter has explored the subjectivity and defined the point at which EEE becomes E-waste: when it is discarded as waste by the owner without the intention of reuse. The term E-Waste can be understood differently, varying by region, country or jurisdiction. The aim is to define E-waste and ensure that other terms used within the definition are clarified thus fully supporting the definition.



CHAPTER-III
INTERNATIONAL LEGAL
FRAMEWORK ON E-WASTE
MANAGEMENT



CHAPTER-III

INTERNATIONAL LEGAL FRAMEWORK ON E-WASTE MANAGEMENT

3.1. INTRODUCTION

Electronic waste is the term used to cover all types of electrical and electronic equipment that has or could enter the waste stream. Although electronic waste is a general term, it has assumed technical usage as a term covering any household or business item with circuitry or electrical components with power or battery supply.¹ These may consist of electrical and electronic equipment and accessories that are non-operational or whose life cycles are extinguished. Obsolete electrical and electronic equipment include computers, televisions, audiovisual recorders, mobile phones, printers and other electronic goods such as air conditioners, electronic toys, washing machines, sewing machines, lawn mowers, elevators, kitchen equipment, therapeutic equipment, surveillance equipment, mobile radio transmitters, refrigerators, and their accessories.²

With the increase in the use of computers, mobile telephones, televisions and other types of electronic and electrical equipment, and the litany of environmental and health risks and challenges arising out of discarded products, diverse initiatives are being undertaken to address this emerging environmental concern; nevertheless, these initiatives are varied in design with varying degrees of success in addressing the challenges that e-waste brings. Against this backdrop, manufacturers of electrical and electronic equipments are continually been subjected to expanding limitations on the substances that they can use to build their products because many are hazardous substances that could potentially harm human beings and the environment.³ According to the Global E-waste Monitor Report in July 01, 2020, global generation of E-waste was estimated to be 53.6 million tons per year. Asia was found to be the

¹ Available at: <http://www.step-initiative.org/initiative/what-is-e-waste.php>. (Visited on July 19, 2019).

² C.P. Bald et al., *The Global E-waste Monitor* (United Nations University, IAS-SCYCLE, 2015).

³ Kurian Joseph, 'Electronic Waste Management in India—Issues and Strategies', *Proceedings of the Eleventh International Waste Management and Landfill Symposium*, 36 (LEAD October 2007).

largest producer of E-waste with a generation rate of 24.9 million tons per year which amounts to a per capita generation rate of 5.6 kg/person-year.⁴

The developed and developing countries are facing the heat of e-waste and have come up with measures for controlling, dealing and combating. Regulations for E-waste management in developed and developing countries through Regulations, Rules and Legislative approaches and observation of implications arising out of it are of prime importance to take stock of preparedness for dealing it. The study the influence and intentions of selected developed countries initiatives in this effort vis a vis developing countries and predict strengths and obstacles to effectiveness of E-waste regulations is need of time. The inclusion of newer approaches of various stakeholders in formulating the rules is requirement and is essential to address the minimization and justified tackling of E-waste situation successfully. The need to define and analyze E-waste, source of inflow, restrictions in and from formal and informal sectors etc are the primary need in the international forum which can address to the economic causes of illegal E-waste export and handling. The addressing of all three entities i.e. enforcing regulatory, compliance and eliminating the health and environmental hazards related to E-waste handling will need to be observed that how far it has been resolved by the regulations and access the need for new regulations⁵.

Despite the integration of this principle into international law in the form of the Basel Convention as well as several regional treaties, on a global level we have experienced only marginal success in curtailing E-waste trading towards countries that lack the appropriate hazardous waste infrastructure.⁶ It is essential to note that the United States, one of the world's largest producers of E-waste, has still not ratified the Basel Convention and does not currently regulate E-waste at the federal level. Alternatively, the EU has ratified the Basel Convention as well as the Basel Ban Amendment and enforced even more stringent regulations to curtail the persistent problem of E-waste exports from the EU towards the African continent. Still, due to definitional ambiguities contained in the Basel Convention regarding

⁴ Vanessa Forti, Cornelis P. Balde, et.al., *The Global E-waste Monitor 2020 Quantities, flows, and the circular economy potential* 104-114 (United Nations University, 2020).

⁵ Umesh Kumar "E – Waste Management through Regulations" 07 *IJEI* 4 (2013).

⁶<http://www.basel.int/TheConvention/Overview/TextoftheConvention/tabid/1275/Default.aspx> (Visited on Feb.5 2018).

whether or not some electronic wastes qualify as hazardous wastes based on their purported use, global traders are able to move massive quantities of hazardous E-waste across borders, without effective environmental or social constraints.⁷ Weaknesses of the current international legal framework governing hazardous wastes with respect to controlling transfers of E-waste are discussed below.

In this chapter, the researcher has analyzed interventions made by organizations and institutions set up in the international and regional level in the field of electronic waste management.

3.2 BASEL CONVENTION ON THE TRANSBOUNDARY MOVEMENT OF HAZARDOUS WASTES AND THEIR DISPOSAL (1989)

The Basel Convention of 1989 was the international community's first attempt at dealing with the problem of toxic trade at a global level. Officially titled The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal was adopted on 22nd March 1989 and entered into force on 5th May 1992 for the purpose of protecting human health and the environment against the adverse effects resulting from the generation, management, transboundary movement and disposal of hazardous and other wastes. Initially, it did not mention E-waste, but later it addressed the issues of electronic waste along with end-of-life ships at the Conference of the Parties of the Basel Agreement in late 2006.⁸ Currently, electronic waste, mobile phones, Polychlorinated Biphenyls (PCBs) and compounds used in industry as heat exchange fluids, in electric transformers and capacitors are among the wastes regulated by the Basel Convention. Many of the global E-waste exports, therefore, are in contrary to the Basel Convention⁹.

Basel Convention to impose obligations on member countries are required to provide transportation and disposal of hazardous waste is carried out by completely harmless to human health and the environment. While a change in the Basel Convention is a measure to control and restrict the transport of hazardous waste from

⁷ Kousar Jahan Ara Begum, "Electronic Waste Management in India: A Review" 46 *IOSR-JHSS* 10 (2013).

⁸ Phillipe Sands and Jacqueline Peel, *Principles of International Environmental Law*, 568 (Cambridge University Press, U.K. 2012).

⁹ V.Umakanth, "Regulation of Hazardous Substances, Law and Policy" 4 *JILI* 510 (1995).

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countries in the OECD. The Basel Convention includes the provisions relating to the operation in case of any damage caused by the transport of hazardous waste, liability cases, and in case of illegal transportation of hazardous waste.¹⁰

The aim of the Basel Convention to control the transboundary movement of hazardous waste and other wastes, as set out in the Annex to the Convention, to reduce the movement of waste from industrialized countries are left or eliminated in the state of the recipient of waste, mainly developing countries. The principle that waste should be disposed of in the state, which was the source of much waste as possible, and if there is a movement of the crossing is possible without harming human health and the environment. As well as to the conditions specified in the Convention. Particularly, it must be approved by the state recipient¹¹.

Basel Convention has set up six main purposes¹² are as follows;

- i) To reduce the transport of hazardous wastes and other wastes across the country to a minimum by the action must take into account the environment.
- ii) For the removal of hazardous wastes and other wastes at source, particularly the removal.
- iii) To reduce the volume and toxicity of hazardous waste to the greatest reduction.
- iv) To ensure that control the transport of hazardous waste to be very strict and take measures to prevent the illegal transport of hazardous waste.
- v) To prohibit the transportation of hazardous waste by ship to countries that have legal potential and administrative technology this is not sufficient to eliminate the environment concerns.
- vi) To provide assistance to developing countries and countries with economies in transition to be able to maintain its management about hazardous waste on the environment.

¹⁰ Birnie Patricia, Boyle Alan, Redgwell, Catherine, *International Law and the Environment*, 478 (Oxford University Press, Oxford, 3rd edn., 2009).

¹¹ Katharina Kummer, "The International Regulation of Transboundary Traffic in Hazardous Wastes: The 1989", 41 *INTL & COMP. L.Q.* 53 (1992).

¹² UNEP, *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*, 1989.

Available At : <http://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf>.

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The Basel Convention is a framework and guidelines for the main action. The import and export of hazardous waste must obtain the consent and approval of the country, as well as to determine the ability of removal.

Although, the Basel Convention to cover the transport of hazardous waste to other countries cannot act freely, and conveniently as before, but it does not prohibit trade or transmission of transboundary hazardous waste. Only requiring the submission of transboundary hazardous waste must be approved or Prior Informed Consent from the destination country and the state. The export of waste has to check to be certain, that the destination country is capable of handling waste without harming the environment or Environmentally Sound Management. For this reason, the movement of hazardous waste from the industrialized countries to the developing countries remains a major problem, which cannot be solved effectively. Especially, when there is a lot of hazardous waste being exported to other countries by claiming that the waste is brought into use or Recyclable or Recoverable Wastes¹³. From such problems, the state party to the Basel Convention in Third Conference of the Parties or COP III, in September 1995, the vote on the amendment to the Basel Convention to prohibit the export of hazardous waste at all from countries that are defined in the Appendix 7, which is attached to the Convention.¹⁴ This includes the countries in OECD, the European Community, and Liechtenstein to the countries outside the OECD, or in other words, the ban on the movement of hazardous waste from developed countries to developing countries. However, the provisions of this amendment, which is often referred to as The Ban Amendment, which has no effect until the state, party to ratify a three-fourths of the states at the meeting and voting in the amount of 62 states. As of November 2005, the state has ratified The Ban Amendment to 61 states. The Ban Amendment is likely to be effective in the near future.¹⁵

¹³U.S. Environment Protection Agency, Electronics: A New Opportunity for Waste Prevention, Reuse, and Recycling. Available at: <http://www.epa.gov/epr>.

¹⁴UNEP, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989. Available at: <http://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf>.

¹⁵Dejo Olowu, E-Wastes in Developing Countries -Legal and Policy Responses, 8/1 *LEADJ* 59 (2012), Available at <http://www.lead-journal.org/content/12059.pdf>.(visited on August, 10, 2020.).

It is noteworthy that the amendment to the Basel Convention that has both supporters and opponents. It is clear that the business and industry in developing countries do not agree with the ban on the export of hazardous wastes a chance strict claimed by some developing countries that are ready to handle the hazardous waste. And it is necessary to use certain types of hazardous waste, such as cathode ray, metal, plastic scrap, the wastes of electrical and electronic devices, and integrated circuits as raw material in the manufacturing process.¹⁶

In addition, the amendments Convention does not prohibit trade, export and import of hazardous waste in the country outside of OECD themselves, of which there are nations not a few, which is a country that is currently being developed in the industry as well. While environmentalists believe that The Ban Amendment is good, that developing countries should join together to support and accelerate the ratification of such amendments. Although, The Ban Amendment has no effect, but the EU has issued a law banning the export of hazardous waste from state members to outside countries of the OECD Group since 1999. In India, there was no clear policy and attitude that will ban the import of hazardous waste at all, but there were some countries which had the clear policy and attitude. In spite of the credible evidence that the countries in Central America and Africa, which has increased the strict ban on the import of hazardous waste, since the early 1990. There has been a flow of hazardous waste from Europe and North America to Asia and Eastern Europe even more. For the African region, Organization of African Unity or OAU that made the Convention on the Prohibition of imported into Africa, which is a hazardous waste, and control of transboundary movements of hazardous wastes within the region, which is also known as the Bamako Convention.¹⁷

A. Obligations under the Basel Convention.

The Obligations under the Basel Convention, it may be classified into 2 type, that is general obligation and our particular duty of states parties.

¹⁶ ZadaLipman, "Basel Action Network, Trade in Hazardous Waste: Environmental Justice Versus Economic Growth Environmental Justice and Legal Process" 50 *MUA* (2012).
Available at :<http://archive.ban.org/library/lipman.html>.

¹⁷James M. Sheehan, "Trashing Free Trade: The Basel Convention's Impact on International Commerce" 15 *CII*, (1996).

a. General obligation¹⁸

- a.** Parties who exercise their right to ban the import of hazardous wastes or other wastes for disposal shall inform the other party informed of their decisions are based on topic no.13.¹⁹
- b.** Parties shall prohibit or shall not permit the export of hazardous wastes and other wastes to the party, which has banned the import of such waste when notified under sub-paragraph 1 (a) above.²⁰
- c.** Parties shall prohibit or shall not permit the export of hazardous wastes and other wastes, if state leaders cannot agree in writing to those imports specifically. For the matter of, the state do not ban the import of waste.²¹

ii) Each party shall take appropriate measures to:²²

- a.** Ensure that the generation of hazardous wastes and other wastes within their state of being reduced to a minimum, taking into account the social, economic, and technology.²³
- b.** Ensure that the facilities are adequate for handling the disposal of hazardous wastes and other wastes that are environmentally friendly, which is located in the state, as it is possible that the removal of the situation.²⁴
- c.** Ensure that a person involved in the management of hazardous wastes or other wastes in their state to implement the necessary steps for prevent pollution from hazardous wastes and other wastes, which arise from such a deal, and if pollution occurs to reduce the potential for human health and the environment to a minimum.²⁵
- d.** Ensure that the transboundary movement of hazardous wastes and other wastes have been reduced to a minimum in order to comply with the management of such waste in an eco-friendly and efficient. And have acted

¹⁸Article, 4 of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989.

¹⁹ Article, 4(1)(a) of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal,1989.

²⁰ Article, 4(1)(b) of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal,1989.

²¹ Article, 4(1)(c) of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal,1989.

²² Article, 4 (2) of the Basel Convention 1989

²³ .Article, 4(2) (a) The Basel Convention, 1989

²⁴ Article, 4(2) (b) The Basel Convention, 1989

²⁵ Article, 4(2) (c) The Basel Convention, 1989

in a manner that protects human health and the environment from the devastating consequences, which may result from such a move.²⁶

- e. Do not allow the export of hazardous wastes or other wastes to a state or group of states in the organization of political and/or economic, which is party. In particular, developing countries that have banned the import of all by its own law. Or if there is reason to believe that the wastes in question will not be managed in eco-friendly criteria to be designated by the parties, in the first meeting.²⁷
- f. Requiring provision of information about the proposed move of crossing, hazardous wastes and other wastes to the relevant Annex V (a) of the Basel Convention. For clearly identify the impact of mobility on the proposed human health and the environment.²⁸
- g. Prevent the import of hazardous wastes and other wastes, if there is reason to believe that the wastes in question will not be dealt with in a friendly environment.²⁹
- h. Cooperation activities with interested parties and organizations, both directly and through the Secretariat. Including, the dissemination of information on the transboundary movement of hazardous wastes and other wastes to improve the management of hazardous waste, which is eco-friendly, and to achieve results in preventing the illegal transport.³⁰

iii) Parties considered the transport of hazardous wastes or other wastes illegally is a crime.³¹

iv) Each party shall take legal measures, services, and other appropriate measures in order to comply and enforce the provisions of this Convention, including measures to prevent and punish acts of violation of the Convention.³²

v) Parties shall not permit the export of hazardous wastes or other wastes to countries that are not party, or imported from a country that is not a party.³³

²⁶ Article, 4(2) (d) The Basel Convention, 1989

²⁷ Article, 4(2) (e) The Basel Convention, 1989

²⁸ Article, 4(2) (f) The Basel Convention, 1989

²⁹ Article, 4(2) (g) The Basel Convention, 1989

³⁰ Article, 4(2) (h) of the Basel Convention, 1989

³¹ Article, 4(3) The Basel Convention, 1989

³² Article, 4(4) The Basel Convention, 1989

vi) Parties agree not to allow the export of hazardous wastes or other wastes for disposal within sixty degrees south latitude on the waste matter will be moving across the country or not.³⁴

vii) Moreover, each party shall;³⁵

- a. Prohibit all persons under its national jurisdiction from transporting or disposing of hazardous wastes or other wastes unless such persons are authorized or allowed to perform such activity.³⁶
- b. Determined that hazardous wastes and other wastes to the transboundary movement to be packaged label and transported in accordance with the rules and standards of international recognition and certification is common in the field of packaging, labelling, and transportation. Including that due account is taken of the practice, which is recognized internationally.³⁷
- c. Requiring documentation attached to the movement of hazardous wastes and other wastes from the starting point to the transboundary movement of waste disposal.³⁸

viii) Each party shall require those hazardous wastes or other wastes, which will be sent out to the particular state and the management of that state has to consider the environment of importer state or any other area which is involved during the process of sending and receiving. Technical guidelines on the management of waste that is eco-friendly under the force of the Convention will be determined by the parties shall, in the first meeting.³⁹

ix) Parties shall take appropriate measures to ensure that the transboundary movement of hazardous wastes and other wastes will be allowed only when;⁴⁰

- a. State of export has no technical ability and the necessary facilities including's the ability to eliminate or place the proper disposal of waste is an effective and eco-friendly.⁴¹

³³ Article, 4(5) The Basel Convention, 1989

³⁴ . Article, 4(6) The Basel Convention, 1989.

³⁵ . Article, 4(7) The Basel Convention, 1989.

³⁶ Article, 4(7) (a) The Basel Convention, 1989.

³⁷ . Article, 4(7) (b) The Basel Convention, 1989.

³⁸ . Article, 4(7) (c) The Basel Convention, 1989.

³⁹ . Article, 4(8) The Basel Convention, 1989.

⁴⁰ . Article, 4(9) The Basel Convention, 1989.

- b. The wastes are problem, which is used in industry to recycle the state of importer.⁴²
- c. Moving across the country is a problem to meets the criteria to be determined by the parties if those criteria would not be different than the purpose of the convention.⁴³

x) Obligations under the convention, the state determined that hazardous wastes and other wastes that have been formed within the state. It must be handled in a friendly environment that cannot be transferred to the state of import or transit.⁴⁴

Xi) Nothing in this Convention shall prevent a Party from imposing additional requirements that are consistent with the provisions of this Convention, and are in accordance with the rules of international law, in order better to protect human health and the environment.⁴⁵

B. The obligations of the parties to the Basel Convention specified member needs;

- i. Notification of hazardous waste (other than those listed) to the secretariat within one month after admission.⁴⁶
- ii. Information involved and changed.⁴⁷
- iii. Information received by the secretariat to the exporters concerned.⁴⁸
- iv. Notify the contracting parties to the Basel Convention to prohibit the import of hazardous waste for disposal⁴⁹.
- v. Prohibit the transport of hazardous waste into the country as associate members⁵⁰.
 - a. The ban on all types of hazardous waste.
 - b. The ban on hazardous waste into something.

⁴¹ . Article, 4(9) (a) The Basel Convention, 1989.

⁴² . Article, 4(9) (b) The Basel Convention, 1989.

⁴³ . Article, 4(9) (c) The Basel Convention, 1989.

⁴⁴ . Article, 4(10) The Basel Convention, 1989.

⁴⁵ . Article, 4(11) The Basel Convention, 1989.

⁴⁶ . Article, 3(1) The Basel Convention, 1989.

⁴⁷ . Article, 3(2) The Basel Convention, 1989.

⁴⁸ . Article, 3(4) The Basel Convention, 1989.

⁴⁹ .*Supra note*, 26.

⁵⁰ .*Supra note*, 27.

- vi) To prepare appropriate measures to ensure that.⁵¹
- a. Domestic hazardous waste reduced to a minimum.
 - b. It is equipped with adequate disposal.
 - c. Individuals associated with the removal procedure must be followed.
 - d. Reduce transboundary transport of hazardous waste to a minimum.
- vii) Do not send hazardous waste to countries with economic or political cooperation⁵².
- viii) The preparation of documents for the transportation of hazardous waste to the recipient country⁵³.
- ix) Prevent the import of hazardous waste if it believes that the current system is not good enough⁵⁴.
- x) Cooperation with other countries that are members and other organizations to disseminate information about hazardous waste⁵⁵.
- xi) Implementation of legal, administrative, defence, penalties, and other measures⁵⁶.
- xii) Do not send hazardous waste to⁵⁷;
- a. The country is not a member of the Basel Convention.
 - b. Any country which is located under sixty degrees south latitude (whether that is a member or not).
- xiii) The transportation of hazardous waste that must⁵⁸;
- a. Registration thereto (mandatory)
 - b. Packaging and labelling according to the standards and specifications.
 - c. Documentation attached to the moving since the beginning.
- xiv) Permit the transportation of waste to the country-specific treatment conditions⁵⁹.

⁵¹ .*Supra note*, 28.

⁵² .*Supra note*, 34.

⁵³ .*Supra note*, 35.

⁵⁴ .*Supra note*, 36.

⁵⁵ .*Supra note*, 37.

⁵⁶ .*Supra note*, 39.

⁵⁷ .*Supra note*, 40, 41.

⁵⁸ .*Supra note*, 42.

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- a. There are no equipment, technical, personnel, facilities, etc., sufficient to eliminate up to standard.
 - b. Used as raw material recycling and reuse.
- xv)** The management of hazardous waste in their country without transferring them to other countries, whether in the circumstances⁶⁰.
- xvi)** To appoint or agency with competent authorities and focal point, then report to the secretariat (within 3 months), and when changes are required to report every time (within 1 month)⁶¹.
- xvii)** Identify or determine the sender of hazardous waste in writing through an agency authorized persons and documents related to the recipient country/countries of transit⁶².
- xviii)** Allowed to export only the formal written response from the recipient and/or the disposal of hazardous waste⁶³.
- xix)** Reply to allow or not allow the transportation of hazardous waste, whether a recipient country, or be passed on to the agency authority/authorities concerned⁶⁴.
- xx)** Responsible for signing the document for moving.
- xxi)** Schedule insurance, parole security or other financial guarantees⁶⁵.
- xxii)** In case of exports, if the recipient country cannot be removed within 90 days of hazardous waste must be returned⁶⁶.
- xxiii)** Proceed to the exporter, or the generation of hazardous waste be returned within 30 days of receipt of notice that the illegal transport of hazardous waste, or responsible for removal at the destination⁶⁷.

⁵⁹ .*Supra note*, 47.

⁶⁰ .*Supra note*, 51.

⁶¹ . Article, 5(1) (2) (3) The Basel Convention, 1989.

⁶² . Article, 6(1) The Basel Convention, 1989.

⁶³ . Article, 6(2) (3) The Basel Convention, 1989.

⁶⁴ . Article, 6(4) (5) (6) (7) (8) (10)The Basel Convention, 1989.

⁶⁵ . Article, 6(11) The Basel Convention, 1989.

⁶⁶ . Article, 8.The Basel Convention, 1989.

⁶⁷ . Article, 9 (1) (2) (3)The Basel Convention, 1989.

xxiv) Recommended preparation of legal protection (national) and the penalties for illegal transport⁶⁸.

xxv) Cooperation with the member states, in the field;

- a.** Providing information on request.
- b.** Monitoring the management of hazardous waste.
- c.** Preparation of the policies, laws, rules, regulations developing technologies/impact study.
- d.** Cooperation for pass on knowledge of technology.
- e.** Cooperation for develop guidelines and appropriate measures.

xxvi) Report an agreement on bilateral, multilateral, regional movements of hazardous wastes to the secretariat accordingly⁶⁹.

xxvii) Adopting a protocol that defines the rules and procedures appropriate action.

xxviii) The incidents of transport within the state party⁷⁰.

xxix) Alignment training and technology transfer on the management of hazardous waste⁷¹.

xxx) Establish a fund to help the damage.

C. Provisions relating to electronic waste

E-waste has been a primary concern of the Basel Convention since 2002, when the MPPI (Mobile Phone Partnership Initiative) was formed at the sixth Conference of Parties (CoP) to the Basel Convention. The MPPI aims to promote the environmentally sound management of end-of-life mobile telephones. In order to achieve this, a guidance document was prepared and was finally adopted at the eleventh Conference of Parties in 2011⁷². At the eighth meeting of the Conference in 2006, the Nairobi Declaration on the Environmentally Sound Management of Electrical and Electronic Waste was adopted, giving the Secretariat of the Basel

⁶⁸ Article, 9(5) The Basel Convention, 1989.

⁶⁹ Article, 11(2) The Basel Convention, 1989.

⁷⁰ Article, 13. The Basel Convention, 1989.

⁷¹ Article, 14(a) The Basel Convention, 1989.

⁷² Sairam Bhat (ed.), *Hand Book on Chemicals and Hazardous Waste Management and Handling in India* (NLSIU Bengaluru, 2019).

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Convention a formal framework within which to operate on the development of a work plan to manage e-waste in an environmentally sound manner. In pursuance of this, the ninth Conference developed a plan that aimed to:

1. Set up programmes for environmentally sound e-waste management in Africa and the Asia-Pacific.
2. Set up the Partnership for Action on Computing Equipment (PACE).
3. Prepare technical guidelines on the trans-boundary movement of e-waste. Consequently, PACE was established in 2008 as a multi-stakeholder entity that aimed to bring together computer manufacturers, recyclers, trade associations, and any other concerned party in order to tackle the issue of environmentally sound management of end-of-life computers and accessories.

In the Basel Convention also outlined hazardous waste, with the type of WEEE included. Waste that is subject to the convention, including;

i). Waste is a hazardous waste as defined in Annex I total of 45 categories, which are hazardous as defined in Annex III, such as explosive, flammable, combustible by themselves, will provide gas to ignite on contact with water, toxic, corrosive, or infectious agents, etc. Later has developed a list of hazardous waste to be more clear, as defined in Annex VIII called List A, which are classified in to 4 broad categories of hazardous waste, a total of 59 types, as for instance;⁷³

- a. Wastes containing metals, such as antimony, arsenic, beryllium, cadmium, lead, mercury, batteries, and the ashes of precious metals from the burning of electronic circuits, etc.
- b. Wastes containing inorganic as the main component, such as cathode ray, catalysts, asbestos, dust and fiber lines, etc.
- c. Wastes containing organic compounds are the main components, such as the extraction of oil from oil refineries or refining, mineral oil, scrap of leather or leather components, etc.
- d. Wastes are composed of organic and inorganic, such as waste from the preparation or manufacture of pharmaceutical product, waste treatment, inks, dyes, pesticides and protection, etc.

⁷³UNEP, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989. Available on: <http://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf>. (visited on Nov. 12, 2018).

In addition, there are a set of waste in Annex IX of the Basel Convention or List B, which is not considered as hazardous waste unless there is material in the Annex I of the components is very much to show the properties of the Annex III, that have 53 types, such as iron and steel scrap, copper scrap, nickel scrap, antimony scrap, cadmium scrap, and electrical and electronic components, etc.⁷⁴

ii). Other waste as defined in Annex II of the Basel Convention, including waste from households, and residues from the incineration of waste from households.

Therefore, the determination of the Basel Convention on Hazardous Waste Annex, it can be adapted for use as electronic waste is listed in Annex III, because the device or piece of electronics such as objects contaminated with toxic waste. Transporting waste remains such technology required to comply with the terms of the obligations under the Basel Convention.⁷⁵

Decision support tools for the management of hazardous wastes and other wastes, including the development of collaborative partnerships between the private and the public sector, the use of techniques and technologies that are successful in the management of hazardous waste in urban areas, and to raise awareness and to promote awareness in the community about the management of waste.⁷⁶

The manual training plan of the waste management about batteries, lead and acids that is environmentally friendly, according to the framework of the Basel Convention. Strengthening the capacity of government officials in the management of hazardous waste and to gather information and create awareness of waste management.

The eighth session of the meeting parties have also agreed to the management of waste in an environmentally friendly manner, including wastes containing or contaminated substances or pesticides and animals, such as aldrin, chlordane, dieldrin, etc., waste contaminated with hexa chlorobenzene used in

⁷⁴ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989. Available at: <http://www.basel.int/convention/basics.html>. (visited on September, 17, 2020).

⁷⁵ E. Hesselbach, M. Ohlendorf, and C. Herrmann, "Configuration of Recycling Networks for Enhanced WEEE Recycling, 11-15 *ECDIM* (2001).

⁷⁶ Shanghai Manual, A Guide for Sustainable Urban Development in the 21st Century. Available at: http://www.un.org/esa/dsd/susdevtopics/sdt_pdfs/shanghaimanual/Chapter%205%20%20Waste_management.df (Visited on July 29, 20018).

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industrial wastes containing, contaminated with dichlorodiphenyltrichloroethane (DDT), dioxins, furans, polychlorinated biphenyl (PCB), etc.

However, the secretariat of the Basel Convention will be distributed to the parties, international organizations, and environmental of non-governmental organization (NGO) and private industry. And the current mission of the Open Ended is preparing to fix the academic management of tires used, as well as review and improve their academic, such as burning on soil (D10), landfill with specially engineered (D5), and management of hazardous wastes from dwelling (Y46)⁷⁷.

Framework for action related to the management of hazardous waste in the country parties. Strategies to implement the Basel Convention in 2005-2010, including the implementation of laws and policies related to hazardous waste prepared, taking advantage of the academic and the preparation of inventory thoroughly for the management of hazardous waste that is friendly to the environment. However, under the framework of the implementation of the project consists of removal or recovery plan based on the preparation of wastes inventory and waste audit, and application of tools to manage the waste that is friendly to the environment. As well as improving the technical innovation, promote the implementation and raising awareness about waste management that is friendly to the environment, all in the form of prevention of waste and reducing waste to a minimum, recycling and disposal.⁷⁸

On the activities within the framework of action to prevent the waste to a minimum include the development of training programs for entrepreneurs and government officials, policy development to promote the transfer of technology, and developing collaborative partnerships with industry to reduce waste projects in all regions⁷⁹.

⁷⁷ Hazardous Waste (Control of Export, Import and Transit) Act 1997 and its Regulation. Available At: [http://www.nea.gov.sg/anti-pollution-radiation-protection/chemical-safety/multilateral-environmental-agreements/hazardous-waste-\(control-of-export-import-and-transit\)-act-1997-and-its-regulation](http://www.nea.gov.sg/anti-pollution-radiation-protection/chemical-safety/multilateral-environmental-agreements/hazardous-waste-(control-of-export-import-and-transit)-act-1997-and-its-regulation) (Visited on June 25, 20018).

⁷⁸.UNEP, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989. Available on: <http://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf>. (Visited on July 15, 20019).

⁷⁹.Achieving Sustainable Development and Promoting Development Cooperation, Dialogues at the Economic and Social Council, United Nations New York, 2008. (Visited on May 21, 20018).

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The waste management that is friendly to the environment that the Basel Convention is to focus on the issue of electronic waste a lot. Which is evident from the discussion that “Creating Innovative Solutions through the Basel Convention for the Environmentally Sound Management.”⁸⁰ The board has adopted Nairobi Declaration on Environmentally Sound Management of Electronic and Electrical Waste as the obligations of the parties to implement the declaration for waste management are handled by a friendly environment.⁸¹

Moreover, the founder of the Basel Convention has landed a collaborative partnership to manage mobile devices (Mobile Phone Partnership Initiative) in 2002 as a partnership between government (experts from member countries), and the private sector (the manufacturer of mobile phones).⁸² Including, Basel Convention Regional Centres with the aim to improve our products and waste management mobile phone that is friendly to the environment and raise awareness to consumers and political leaders. The working group has developed the four projects,⁸³ viz.

- i) Mobile Phone Refurbishment.
- ii) Collection and Transboundary Movement.
- iii) Recovery and Recycling.
- iv) Design Consideration.

Each project has documented guidelines as a basis for implementing a pilot program for the collection and management of mobile phone use, or the end of life in developing countries.

⁸⁰ The conference of the parties to the Basel Convention on the eighth session, on 27 November-1 December 2006, under the name of the conference that “World Forum on E-waste”. (Visited on May 29, 20019).

⁸¹ World Forum on E-waste: Note by the Secretariat Fourth meeting of the Expanded Bureau of the seventh meeting of the Conference of the Parties to the Basel Convention Nairobi, 26 November 2006.

Available At: <http://www.archive.basel.int/meetings/bureau/bureau%204%20cop%207/02e.pdf> (Visited on July 29, 2020).

⁸² *Available at:* <http://www.basel.int/Implementation/TechnicalAssistance/Partnerships/MPPI/Overview/tabid/3268/Default.aspx>. (Visited on Aug. 12, 2020).

⁸³ Basel Convention, mobile phone partnership initiative guidance document on the environmentally sound management of used and end-of-life mobile phones June, 30.2010.

Available At : <http://archive.basel.int/industry/mppi/gdfd30Jun2010.pdf>. (Visited on July 29, 2020).

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In addition, the Basel Convention has also initiated the Global Computer Refurbishment and Recycling Partnership, also known as the “e2e”. This is intended to allow manufacturers of computers and related electronic component manufacturers to participate in the increase of reuse and recycling system, including circuit board, keyboard, mouse, printer, speakers, etc. for reduction of posing these computers and electronic components in landfill. The working group of e2e is conducted by United Nations Environment Program and United Nations University. In addition to operating on a global scale, there are efforts at the regional level to deal with electronic waste. Basel Convention on Regional Centers Basel Convention in Asia Pacific three places (regional centers in China and Indonesia, and projects of the South Pacific region) for the project “Environmentally Sound Management of Electrical and Electronic Waste in Asia and the Pacific”, which emerged from the realization of the Asia and Pacific on electronic waste issues, and the need to get the latest information on waste management and information about eco-friendly ness.⁸⁴

The project is aimed at reducing barriers to countries in the region to manage E-waste that is eco-friendly. It will help to support the program of the party, both at the national and local levels to reduce the amount of waste dumped in the landfill by increasing the reuse and recycling of electronic waste in lieu of it. However, the project sought to be in a collaborative partnership in the management of electronic waste that is eco-friendly in the Asia-Pacific region strategic components, which defines the action plan during 2007-2008, including the development and monitoring of the implementation of the memorandum about understanding of the project which was initiated at all, inviting stakeholders to participate in collaborative partnerships, the pilot on the management of electronic waste that is friendly to the environment by using the guidelines of regional development, funding for the project, the project based on the results from the accounting system of electronic waste, and other activities of the budget is available.⁸⁵

⁸⁴ .World Forum on E-waste: Note by the Fourth meeting of the Expanded Bureau of the seventh meeting of the Conference of the Parties to the Basel Convention Nairobi, 26 November 2006. *Available At:* <http://www.archive.basel.int/meetings/bureau/bureau%204%20cop%207/02e.pdf>. (Visited on July 29, 2019).

⁸⁵.Cointreau, Sandra, “Declaration of Principles for Sustainable and Integrated Solid Waste Management” 40 *SISWM* (2015). *Available At:* <http://siteresources.worldbank.org/INTUSWM/Resources/siswm.pdf>. (Visited on Jan. 19, 2019).

3.3. Ban Amendment

Legislation governing the transport of hazardous waste, including the Basel convention, amendments to the Basel Convention on the Prohibition of the export of hazardous wastes, and the Basel Protocol. Basel Convention was amended to increase rigor in controlling the movement of hazardous waste across the region by the congress party to the Basel Convention on the third session (COP 3) in 1995, passed a resolution unanimously to prepare “amendments to the Basel Convention on the Prohibition of the export of hazardous wastes” called Ban Amendment. The amendments to the Basel Convention to ban the countries specified in Annex VII, including countries in the OECD, European Commission (EC), and Liechtenstein export of hazardous waste to countries that are not listed in Annex VII to final disposal immediately and not allowed to reuse and recycling, on 31, December 1997.⁸⁶ The section seventeen paragraph five of the Basel Convention on the twenty-eighth amendment, the Basel Convention will enter into force within ninety days to be ratified, granting approval, or the formal acceptance of such amendments by the parties at least three-fourths of the parties to accept the amendment at that time.⁸⁷

However, the conference of the parties to the Basel Convention, the forth to seventh sessions, the resolution urges the parties to the Basel Convention ratified the amendment prohibits the export of hazardous waste in the Basel Convention on the decision III/I as soon as possible, to give these modifications which are immediately effective. And from the disposal of toxic waste at Abidjan in Ivory Coast, in August 2006. Parties made at the meeting of parties to the Basel Convention, the eighth session, in December 2006. This was awake and turned to support the enforcement of amendments to the Convention more. Including South Korea, which were the object to modify the Basel Convention, especially with a group of JUSCANZ30 (BAN, 2006b), but because of the controversies about the interpretation of the “Parties agree to the Editor”, section seventh paragraph five of the Basel Convention. This makes

⁸⁶ Decisions adopted by the Third Meeting of the Basel Convention, U.N. Doc. UNEP/CHW.3/35. Available at: <http://digitalcommons.pace.edu/cgi/viewcontent.cgi?article=1269&context=pilr> (Visited on Jan. 25, 2019).

⁸⁷ The Basel Ban Amendment requires sixty-six country ratifications, representing three-fourths of the eighty seven parties present at the Third Meeting of the Conference of the Parties, to take effect. Despite the fifty-one Ratifications, the issue as to when the Basel Ban Amendment shall enter into force remains controversial. Ban Ratification Deposit Box, Basel Action Network, Available at: <http://www.ban.org/deposit-box/> (Visited on Jan. 25, 2019).

the meeting also decided not to fix the Basel Convention into force as soon as available. Despite, the ratification of the amendments to the Convention continued during the meeting (December 2006), the sixty-third edition of the conference already. In this regard, the meeting was assigned to the mission of the Open-ended for the solution to the issue and put a plan of work for 2007- 2008 anyway⁸⁸.

3.4. Basel Protocol

The Basel Protocol on liability and damages caused by the movement and disposal of hazardous waste across borders. The protocol to identify the damage caused by the transport to hazardous waste from land and indemnity, due to damage caused by hazardous waste is fierce and cause as much damage. General measures law also limits the damages, and the court has defined the Basel Protocol obligations of the contracting parties.

The Basel Protocol on liability and damages caused by the movement and disposal of hazardous waste across borders is the result of the meeting of the parties to the Basel Convention, the fifth session, in 1999. Parties have to approve the Basel Protocol on liability and indemnity of transboundary movements of hazardous wastes and their disposal, known as short Basel Protocol. This will apply to damage caused by events occurring during transport, and disposal of hazardous waste across the region, including the transport of illegal and forced the country parties to the Basel Convention to ratify the protocol only. The responsibilities of the state and the individuals involved, including the informant, the removal, and others. However, the parties shall take legal measures to inform the secretariat on measures to comply with the protocol.⁸⁹

The Basel Convention has been extended to the relevant provisions of the thirteen principles of the Rio Declaration on Environment and Development 1992. The state must develop national and international law regarding liability and damages from pollution and other environmental damage. As a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and

⁸⁸ Alan Andrews, 'Beyond the Ban -can the Basel Convention adequately Safeguard the Interests of the World's Poor in the International Trade of Hazardous Waste' 167 *LEDJ* (2009). available at <http://www.lead-journal.org/content/09167.pdf>. (Visited on Feb. 12, 2019).

⁸⁹ Lucas Bergkamp, "Liability and Environment: Private and Public Law Aspects of Civil Liability for Environmental Harm Iran International Context" 34 *MNP* (2001).

their Disposal, without respect to its obligations under the convention to recognize the risk of damage to human health, property, and the environment. This is caused by hazardous wastes and other wastes, and movement of those wastes, including, concerns the problem of illegal transboundary movement of hazardous wastes and other wastes, which is bound to Article 12 of the convention. This protocol focus on the need to formulate rules and procedures on liability and redress for damage resulting from transboundary movement and disposal of hazardous wastes and other wastes. By the need to provide third party liability and environmental liability to ensure that it has sufficient compensation for damages as a result of the movement and disposal of hazardous wastes and other wastes⁹⁰.

The purpose of the protocol is to provide a comprehensive management liability and damages adequately and promptly for any damages resulting from the transboundary movement and disposal of hazardous wastes and other wastes, including the illegal movement of such wastes⁹¹. Basel Protocol has identified “damage” caused by the transboundary movement and disposal of hazardous wastes and other wastes, including the illegal movement of waste, that means;

- i) The loss of life, or the illness of a person.⁹²
- ii) Loss or damage to property other than the property of the person liable under this protocol.⁹³
- iii) Loss of income caused directly by the benefits resulting from the degradation of the⁹⁴ environment, taking into account the revenue and expenditure.
- iv) The cost of the measures used in the restoration of degraded environments to restore limited by the cost of the measures, which are continuing.⁹⁵
- v) The cost of preventive measures, including any loss or damage caused by such measures as the damage occurs. After all, the properties of the waste associated with

⁹⁰ Katharina Kummer, *International Management of Hazardous Wastes: The Basel Convention and Related Legal Rules*, 36 (Oxford University Press, 1999).

⁹¹ Article 2, Basel Protocol on Liability and Compensation for Damage Transboundary Movements of Hazardous Wastes and their Disposal, 1999.

⁹² Article 2, (c) (I) Basel Protocol, 1999.

⁹³ Article 2, (c) (ii) Basel Protocol, 1999.

⁹⁴ Article 2, (c) (iii) Basel Protocol, 1999.

⁹⁵ Article 2, (c) (iv) Basel Protocol, 1999.

the movement and disposal of hazardous wastes and other wastes that are listed in the convention.⁹⁶

In case of damage is dealt two respects, that is;⁹⁷

i) “Restoration measures” means any reasonable measures aimed at assessing the environmental restoration or repair of damaged or destroyed, restored to its original condition. By local law may identify the responsibility to implement such measures.

ii) “Preventive measures” means any reasonable measures taken by the person who is responsible for the incident to prevent, minimize, or mitigate loss or damage, or for the restoration of the environment.

The scope of application protocol shall apply to damage caused by events occurring during the transboundary movement of hazardous wastes and other wastes, and waste disposal. Including illegal transportation of the waste was unloading of transport within areas under national jurisdiction of the state of export. Notice to the contracting parties may retain about excluding the applicability of the protocol in respect of the transboundary movement. For such an event was under the jurisdiction of the section on corruption within the sovereignty of the state of export. The secretariat shall circulate the request of the contracting parties.⁹⁸

Basel Protocol establishes strict liability by a person specified in article 4 of the convention shall be liable for damages. Until, the removal will occupy hazardous waste and other waste. After that, the removal shall be liable in damages, in that case, the state exported as an informant. Or, if no notification, the exporter shall be liable in damages. Until, the removal will occupy hazardous waste and other waste. After that, the removal shall be liable in damages. The state is not imported by the state of export. Importer is responsible. Until, the removal will occupy hazardous waste and other waste.⁹⁹ If, the state is imported as an informant or if no notification occur. After that, the removal shall be liable for damages. If hazardous wastes and other wastes were recycled, the person who submits will be liable for damages since

⁹⁶Article 2, (c) (v) Basel Protocol, 1999.

⁹⁷UNEP/CBD/BS/WG-L&R/3/2/Add.1, 20 December 2006

⁹⁸ Article 3, Basel Protocol

⁹⁹ Article 4, Basel Protocol

the time of hazardous wastes disposal site, until the waste has been dominated by the exporter or other removal.

However, there is no liability if such person proves that the damage is;¹⁰⁰

- i) Result of armed conflict, the enemy, civil war, or rebellion.¹⁰¹
- ii) The result of a natural phenomenon that is unique, inevitable, unpredictable, and irresistible.¹⁰²
- iii) All of which arise from the implementation of the measures of the government agency with the power to which the damage occurred.
- iv) The result of all that is caused by the wrongful act of a third party intentionally or individuals who have been damaged.¹⁰³

Basel Protocol lays out a practical way for the parties, that;¹⁰⁴

- i) Contracting parties shall take measures, including legislation, regulations, and administrative obligations of the protocol.¹⁰⁵
- ii) For clarity, the contracting parties shall notify the secretariat on various measures to comply with the protocol. The limitation of liability specified in the first paragraph of Annex B.¹⁰⁶
- iii) Provisions of this protocol shall be enforced without discrimination based on nationality, domicile, or residence.¹⁰⁷

Basel Convention on the limitation of liability, that;¹⁰⁸

- i) Claims for damages under the protocol will not be achieved unless the claims are processed within ten years from the date of the loss event.¹⁰⁹

¹⁰⁰ Article 4(5), Basel Protocol

¹⁰¹ Article 4,(5)(a) Basel Protocol

¹⁰² Article 4,(5)(b) Basel Protocol, 1999.

¹⁰³ Article 4,(5)(c) Basel Protocol, 1999.

¹⁰⁴ Article 10, Basel Protocol, 1999.

¹⁰⁵ Article 10(1), Basel Protocol, 1999.

¹⁰⁶ Article 10(2), Basel Protocol, 1999.

¹⁰⁷ Article 10(3), Basel Protocol, 1999.

¹⁰⁸ Article 13, Basel Protocol,1999.

¹⁰⁹ Article 13(13), Basel Protocol, 1999.

ii) Claims for damages under the protocol will not be possible unless performed within 5 years from the date that the claimant knew or reasonably should have known for the damage. However, the restrictions which are mentioned in first paragraph are more than second paragraph.¹¹⁰

iii) In case if the event consists of a sequence of events that occur with the same cause. Limitations time since the last event. In the case of the incident continues. Limitations of time are continued since the end of event.¹¹¹

Insurance and other financial security is a major criterion of the Basel Protocol. The Basel Protocol is a set of requirements, that;¹¹²

i) Party liability insurance must provide a bond or other financial security to protect against such liability over the term of the liability. The amount of coverage is less than the minimum limits as specified in the second paragraph of Annex B. State may fulfill its obligations, under this paragraph, by notifying the insurance themselves. The provisions of this paragraph shall not limit the liability first, or shared between the insurers to pay it. But not to lift out of the insured is unable to pay damages in the first section, or share paid in respect of its responsibility as a justification to pay compensation to individuals who have been damaged.¹¹³

ii) For the liability of the notifier or exporter, under Article IV, paragraph one, or the importer, under Article IV, paragraph two. The insurance bond, or other financial guarantees referred to in the first paragraph of this article are intended for restitution. The damage mentioned in Article II of the protocol only.¹¹⁴

iii) Document that provides coverage for the liability of the notifier or exporter under Article IV, paragraph one, or the importer, under Article IV, paragraph two of the protocol, that shall be attached to the notice referred to in Article VI of the convention. The proof of coverage for the liability of the removal must be submitted to the agency with the power of the state to import it.¹¹⁵

¹¹⁰ Article 13(2), Basel Protocol, 1999.

¹¹¹ Article 13(3), Basel Protocol

¹¹² Article 14, Basel Protocol

¹¹³ Article 14(1), Basel Protocol

¹¹⁴ Article 14(2), Basel Protocol

¹¹⁵ Article 14(3), Basel Protocol

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iv) Any claim under the protocol may be made directly to the underwriters, issuers of bonds, the issuer of other financial guarantees. By insurers or other financial collateral issuer has the right to demand that the person is liable, under the Article IV, into the process. In addition, the insurer or other financial security detention order may exercise its right to raise a defence that the person is liable, under Article IV is entitled.¹¹⁶

v) Whether the provisions of paragraph four is provided or not. In case, the parties wish to keep the right to bring an action directly, in the fourth paragraph. The contracting parties shall notify storage protocol at the time of signing, ratification or approval, or accession to this protocol to request it. And the secretariat has to keep the information of parties who have made a notification under this paragraph.¹¹⁷

Basel protocol has set up financial mechanisms used in the operation, which is as follows:¹¹⁸

i) In the case of a refund under the protocol does not cover the damage. Other support measures that are intended to provide adequate and timely reimbursement may be available through existing mechanisms.¹¹⁹

ii) The conference of the parties shall review the requirements and the possibility to develop a mechanism to existing or new financing mechanisms going on.¹²⁰

Protocol is open for signature by states and regional economic cooperation organization that is a party to the Basel Convention at the Ministry of Foreign Affairs at Bern, in Switzerland from 6th to 17th March 2000 and at United Nations (UN) headquarters in New York from 1st April 2000 to 1st December 2000¹²¹.

Protocol shall be subject to ratification, acceptance or approval by the state and has been confirmed or to provide formal approval from the regional economic cooperation organization. Instruments of ratification, acceptance substance, material verification, or substance of the approval shall be deposited with the keeper¹²².

¹¹⁶ Article 14(5), Basel Protocol

¹¹⁷ Article 14(5), Basel Protocol

¹¹⁸ Article 15, Basel Protocol

¹¹⁹ Article 14(1), Basel Protocol

¹²⁰ Article 14(2), Basel Protocol

¹²¹ *Supra note* 115

¹²² Article 27(1), Basel Protocol

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Protocol will enter into force after 90 days from the date of ratification, acceptance substance, substance confirmed officially.¹²³ The substance of the approval or accession, No. 20, for each state or regional economic cooperation organization, that has ratification, acceptance, approval or official confirmation. Protocol or accession has after the date of the instruments of ratification, acceptance substance, the substance of the approval, formal confirmation or accession of the substance, No. 20. Protocol will enter into force after 90 days from the state or regional economic cooperation organizations, such as the instruments of ratification, acceptance substance, the substance of the approval, formal confirmation or accession of the substance.¹²⁴

The essence of the Basel Convention is shown in cross-border transportation and disposal of hazardous waste if the damage occurred during transportation. Whether it is a hazardous waste spill, explosion, or cause damage to humans, plants and animals during transport or accident during transport. It would be liable to occur in different ways. Whether it is a liability to the direct costs, such as cleaning and restoration of the environment, or the indirect costs associated with lost productivity are affected in these areas, and the damage to the people of the area, which may include injury, a sudden death, or loss of income, etc. Which, some damage may be contained in a brief appearance, but some damage may take several years after the event¹²⁵.

The protocol in liability and indemnify the movement of waste and disposal, which was adopted by the conference of the Basel Convention on 10 December 1999. The purpose of the protocol is to provide an overall framework for liability and cause sufficient restitution for the damage resulting from the transport of hazardous wastes and other wastes, including accidents caused by the transport of hazardous waste illegally. Protocol has looked to the person who shall have no liability in matters of finance in case an accident happens at each stage of the transportation of the hazardous waste that is placed on a vehicle to transport in one state to be exported to other states. State that have passed, including export and final

¹²³ Article 29, Basel Protocol

¹²⁴ Article 29(2), Basel Protocol

¹²⁵ Article 07, Basel Convention

disposal have been merged into consideration¹²⁶. All members have agreed to implement, implementation of assistance, capacity of building in an emergency, the establishment of a fund or funds to compensate. This may be something that cannot make the Basel Protocol has not been brought into force by considering it, as follows;¹²⁷

i) Basel Protocol was initiated in 1993, in connection with developing countries, which lack the funds and the technology which is going to be at the disposal of hazardous waste. The state would not be able to deal with the discarded waste which is illegal, or in the case of an accident by moving those wastes. Basel Protocol has been considered and approved in fifth Conference of the Parties or COP 5, in December 1999. At present, it is open to various states have joined the ratification of the Basel Convention.¹²⁸ There are 13 countries, which have signed the protocol during the first year after a meeting of COP 5. And after the opening, with the signing of the step, there is no country that ratified.

Basel Convention on the transport of hazardous wastes and their disposal was adopted in 1992, and relating to the implementation of each year with the transportation of hazardous waste in a volume of several million tons. The hazardous waste that was being considered as waste, that is dangerous to the public, the environment, and while it has its toxicity, which may explode, erupt, or flare. Including, possibly causing an infection, or toxicity ecosystem. Such conventions regulating the transportation of hazardous waste and obligation of members to ensure that hazardous waste is managed, and disposed, that will not harm the environment. Governments are expected to have the amount of waste being transported to a minimum, and the same has to be performed, and the disposal of waste in the way that is most feasible.¹²⁹ And cause or perform of any measure to reduce the waste from the source as possible.

¹²⁶ *Supra note 112*

¹²⁷ Patricia Nemeth, "Why has the Basel Convention not adequately addressed the transboundary movements of hazardous waste to the developing world" 25 *RUNSL* (2014).

¹²⁸ Basel Action Network, Report and Analysis of the Fifth Conference of the Parties to the Basel Convention, (1999).

¹²⁹ Secretariat of Basel Convention, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Adopted by the Conference of Parties on March 22, 1989.

Australia has raised the issue of the timing of the signing of the protocol by COP 5, especially on the issues involved. This was interpreted by Australia drafting considerations in Article 3, Paragraph 6, the granting of permission to take the liability and indemnity as the domestic law as an associate member of the Article 11¹³⁰.

The agreement must provide for the operation or liability, and especially the use of management involved.

ii) Members of the agreement or arrangement shall be a person who can decide that the law in a particular country or the liability will occur or not, according to the Article 11 of the agreement. A joint meeting of the need to complete and submit the requirements of the protocol, the secretary informed the members of Article 3.6 and Article 3.6 (a) to be taken out completely.

iii) The fact that the liability to be applied, and the framework of the compensation must be carried out in order to fully meet the objectives in its entirety.

3.5. ROTTERDAM CONVENTION ON THE PRIOR INFORMED CONSENT PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE, 1998

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Chemicals and Pesticides in International Trade which was adopted in September, 1998. It consists of 30 Articles and 7 Annexure.¹³¹

It is a multilateral treaty to promote shared responsibilities between exporting and importing countries in protecting human health and environment from the harmful effects of hazardous chemicals. The Convention promotes exchange of information among Parties over a broad range of potentially hazardous chemicals that may be exported or imported. A key goal is to provide technical assistance for developing countries and countries with economies in transition to develop the

¹³⁰.UNEP, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989. Available on: <http://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf>. (Visited on Jan. 19, 2020).

¹³¹ Available at: <http://www.pic.int/TheConvention/Overview/TextoftheConvention/tabid/1048/language/en-US/Default.aspx> (last visited on October, 21, 2020).

infrastructure and capacity necessary to implement the provisions of the Convention.¹³²

The Rotterdam Convention calls on exporters of hazardous chemicals to use proper labelling, include directions on safe handling, and inform purchasers about known restrictions or bans. Parties can decide whether to allow or ban the import of chemicals listed in the treaty, and countries exporting chemicals are obliged to make sure that producers within their jurisdiction comply with the directions and rules. The Parties have nine months to prepare a response concerning the future import of the chemical.¹³³ The response can consist of either a final decision- to allow import of the chemical, not to allow import, or to allow import subject to specified conditions- or an interim response. Decisions by an importing country must be trade neutral, that is, apply equally to domestic production for domestic use as well as to imports from any source. The Convention requires each Party to notify the Secretariat, provided jointly by the FAO and UNEP, when taking a domestic regulatory action to ban or severely restrict a chemical.¹³⁴

Apart from the principle of Prior Informed Consent, the Rotterdam Convention highlights another principle of the Basel Convention which deals with transparency and Environmentally Sound Management (ESM) of hazardous substances. Among the 40 chemical substances covered under the Convention, mercury compounds, poly brominated biphenyls (PBB), polychlorinated biphenyls (PCB) are also substances that are found in E-waste.¹³⁵

3.6. STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS, (2001)

The Stockholm Convention on Persistent Organic Pollutants was adopted in 2001 and entered into force on 17 May 2004, is a globally binding international treaty that aims to eliminate or restrict the production, use, storage, trade of Persistent Organic Pollutants (POPs). POPs are organic compounds that are resistant

¹³² Rotterdam Convention, Wikipedia, https://en.wikipedia.org/wiki/Rotterdam_Convention (Visited on Jan 25, 2019).

¹³³ Article 2, of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1998.

¹³⁴ E -Waste in India, Research Unit Rajya Sabha Secretariat New Delhi, 2011.

¹³⁵ https://www.researchgate.net/profile/Paul_Appasamy/publication/267256041_International_Conventions_on_Hazardous_Chemicals/links/55daee6908aeb38e8a8a2c7c/International-Conventions-on-Hazardous-Chemicals.pdf. (Visited on March 12, 2019).

to environmental degradation through chemical, biological and photolytic processes, they bio accumulate and are transported through air, water and migratory species, across international boundaries and are deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems¹³⁶.

E-waste contains many chemicals classified as POPs. The Convention aims to protect human health and the environment from chemicals that remain persistent in the environment for long periods, are distributed globally and accumulate in the fatty tissue of humans and animals. There are three identified categories of POPs: pesticides, industrial chemicals and unintentionally produced by-products.¹³⁷

3.7. THE BAMAKO CONVENTION, 1991

The Bamako Convention on the Ban of the African Importation and Control of Transboundary Movements of Hazardous Waste was negotiated in January 1991, and came into force in 1998 by the twelve nations of the Organization for African Unity.¹³⁸ This convention consists of 30 Articles and 5 Annexure. The Convention aims to protect human health and the environment from the hazards of hazardous waste by minimizing their generation in terms of hazardous quantity and potential. All contracting parties are required to prohibit the importation of all hazardous waste from non-contracting parties into Africa for any reason.¹³⁹ The provisions of the Bamako Convention state that the disposal of radioactive waste, industrial waste, sewage and sewage sludge is prohibited. The Bamako Convention requires the contracting parties to monitor their respective waterways to ensure that no dumping occurs.¹⁴⁰ The Convention also imposes duty that each State party must report annually to the Secretariat.

The categories¹⁴¹ of wastes listed in Annex I to the Bamako Convention, a waste possessing any of the characteristics listed in Annex II to the Bamako Convention, as well as any waste considered to be hazardous by the domestic laws of either the state of import, export, or transit are considered hazardous wastes for

¹³⁶ Sairam Bhat (ed.), *Hand Book on Chemicals and Hazardous Waste Management and Handling in India* (NLSIU Bengaluru, 2019).

¹³⁷ Article,1 of the Stockholm Convention on Persistent Organic Pollutants 2001.

¹³⁸ Available at: <https://www.unenvironment.org/news-and-stories/press-release/bamako-convention-time-africa-move-decisions-action-hazardous-0>. (last visited on October, 21, 2020).

¹³⁹ *Ibid.*

¹⁴⁰ Bamako Convention. art.2.

¹⁴¹ Bamako Convention”, International Maritime Organisation, 09 December, 2005

the purposes of the Bamako Convention.¹⁴² It is clear from the provisions of the Bamako Convention that the dumping of radioactive wastes, industrial wastes, sewage and sewage sludge is prohibited. The Bamako Convention places the duty on the Parties to monitor their respective waterways to ensure that no dumping occurs.¹⁴³ Each State Party has to report annually to the Secretariat.

3.8. THE DURBAN DECLARATION 2006

The Durban Declaration on E-Waste Management in Africa followed the 2006 Nairobi ministerial declaration on E-waste developed from COP8 of the Basel Convention. It requires countries to follow their own process to define their responses and formulate actions in relation to the E-waste problem. It calls for the establishment of an African regional platform and/or an E-waste forum in cooperation with established African networks and international bodies. It requires countries to review existing legislation, improve compliance with existing legislation and amend existing waste management legislation to allow for regulation of E-waste management. As a result, several African countries are in the process of drawing up policies regarding E-waste. Nevertheless, policies centering on banning or regulating imports or practices such as open burning have so far been weakly enforced¹⁴⁴.

3.9. THE AARHUS CONVENTION, 1998

The Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters adopted on 25th June in 1998. It consist of 22 Articles and two Annexure. The main objective of the Convention is as follows:

“In order to contribute to the protection of right of every person of present and future generations to live in an environment adequate to his or her health and wellbeing, each party shall guarantee the rights of access to information, public participation in decision making, and access to justice in environmental matters in accordance with the provisions of this convention.”¹⁴⁵ Under the Convention, the

¹⁴² The Preamble to the Bamako Convention.

¹⁴³ Article.2, Bamako Convention

¹⁴⁴ UNEP/CHW.8/CRP.24 1 December 2006.

Available at : <http://archive.basel.int/industry/compartnership/NairobiDeclarationCRP24.pdf>

¹⁴⁵ Aarhus Convention, art. 1;

Aarhus Protocol on Heavy Metals was one of eight protocols intended to address air quality issues within the EU.

3.10. THE WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) DIRECTIVE, 2002

The WEEE Directive of the European Parliament and of the Council (2002/96/EC) entered into force in 2003. The aim of the legislation is the prevention of E-waste generation, and to promote the reuse, recycling and other forms of recovery of such waste so as to reduce disposal. It also seeks to improve the environmental performance of all operators involved in the life cycle of electrical and electronic equipment and, in particular, those operators directly involved in the treatment of E-waste. It is based on the principle of producer responsibility and promotes the green design and production of electronic products. It includes separate collection of E-waste, and the use of best available treatment, recovery and recycling techniques, and makes producers responsible for financing the take-back and management of E-waste. The global electrical and electronics industry has come under increasing pressure to adopt EPR policies because of the European Directive.¹⁴⁶

However, despite extensive legislation targeting the E-waste problem, experience in the first few years of implementation of the WEEE Directive has shown that it is facing difficulties. Less than half of the collected E-waste is currently treated and reported according to the Directive's requirements. The prevalence of loopholes and difficulties in enforcement has reduced the effectiveness of the EU legislation. It has been found that, of the vast majority of E-waste, 67 per cent is completely unaccounted for, being either land filled or destined for illegal export to developing countries. In addition, the collection target of 4 kg per person per year does not properly reflect the amount and growth of E-waste arising in EU Member States. As a response to these unsatisfactory outcomes, the European Commission started revising the Directives in 2008 with the aim of increasing the

¹⁴⁶ Noah Sachs "EPR places the onus on producers to provide for the long-term environmental responsibility of their products in a "cradle-to-grave" chain, from production to distribution to recycling, reuse, and sustainable product design" 65 *HELR* 30 (2006).

amount of E-waste that is appropriately treated and reducing the volume that goes to disposal. Another overall aim is to better control the illegal trade of E-waste.¹⁴⁷

The proposals also aim to reduce administrative burdens and ensure coherence with newer policies and legislation such as the new legislative framework for the marketing of products. The new proposals set a mandatory collection target equal to 65 per cent of the average weight of E-waste placed on the market over the two previous years in each Member State. As a result, Member States with a high consumption of electronic equipment would have more ambitious collection targets. Overall, the objective of the proposed directives is to develop a better regulatory environment one that is simple, understandable, effective and enforceable. On 7 June 2012, the EC adopted a directive that both increase the amount of E-waste which must be collected annually by member states and establishes producer responsibility. In addition, the scope of the legislation was widened so as to cover all E-waste in principle.¹⁴⁸

A. Restriction of Hazardous Substances (RoHS) Directive, 2003

As a legislative initiative to solve the problem of huge amounts of toxic E-waste, a Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment, namely 2002/95/EC, commonly referred to as the Restriction of Hazardous Substances Directive or RoHS was adopted in February 2003 by the European Union. The RoHS Directive came into force with effect from 1 July 2006, and is required to be enforced and become law in each member state. The Directive restricts the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment.¹⁴⁹

In order to prevent the generation of hazardous waste, the RoHS Directive requires the substitution of various heavy metals, namely lead, mercury, cadmium, hexavalent chromium and brominated flame retardants like polybrominated

¹⁴⁷ *Supra note*, 137.

¹⁴⁸ E.Hesselbach, M. Ohlendorf, and C. Herrmann, "Configuration of Recycling Networks for Enhanced WEEE Recycling, 11-15 *ECDIM* (2001).

¹⁴⁹ *Available At*: http://collegebuddi.com/material_science/restriction_of_hazardous_substances_directive.php.

biphenyls (PBB) or poly-brominated biphenyl ethers (PBDE) in new electrical and electronic equipments put on the market since 1 July, 2006.¹⁵⁰

In brief, the WEEE Directive obliges a producer of electronic equipment to be responsible for the product at the end of its consumer life. The RoHS Directive takes a step further by requiring manufacturers to phase out the use of hazardous substances in the production of electrical and electronics equipment by 2008.¹⁵¹

B. Communication on the use of the Precautionary Principle

On second February, 2000, the European Commission adopted the communication on the use of the Precautionary Principle as a central tenet of its policy. This Principle would form part of a structured approach to the analysis of risk as well as risk management. It is primarily aimed at building a common understanding of how to assess, appraise, manage and communicate risks which science is not yet able to evaluate fully and, at the same time, avoid unwarranted recourse to the precautionary principle, as a disguised form of protectionism. Application of this Principle would help prevent the use of some high risk products in electrical and electronic equipment's to some extent.

C. The Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

The Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) entered into force in 2007 with the main aim of ensuring a high level of protection of human health and the environment from the risks that can be posed by chemicals. REACH makes industry responsible for assessing and managing the risks posed by chemicals and providing appropriate safety information to their users.

D. Obligations of the Producer under the WEEE

The WEEE Directive imposes most of the obligations on the producer of the electrical and electronic equipments (EEE). Article, 4 of the WEEE Directive requires the producer to design the products in such a way that will facilitate

¹⁵⁰ Wikipedia, 'Waste Electrical and Electronic Equipment Directive', <<http://en.wikipedia.org/>>

¹⁵¹ United Nations Environment Programme, "E-waste" 43 *IAMDT*, Osaka, (2007).

dismantling and recovery. In addition, the producer is required not to prevent, through specific design features or manufacturing processes, the E-waste from being reused unless it is compromising the environment and/or safety requirements. Under Article 5 (3), the producer is obliged to collect waste electrical and electronic equipment at its end of life.¹⁵²

The treatment of the EEE, when handed over to a facility for de-pollution, dis-assembly, shredding, recovery, or preparation for disposal, has to be the ‘best available treatment’ which includes the removal of all fluids and, in accordance with Annexe II to the WEEE Directive, the 84 removal of certain substances, consumables and components from any separately collected WEEE. Article 7(1) obliges the producers to set up a recovery system either individually or by joining a collective system. The responsibility for collection, recovery and the financing thereof are governed by two parameters. If a product or so-called ‘historical waste’ was put on the market on or before 13 August, 2005, then the product is a business-to-consumer (B2C) product and the responsibility has to be borne by the producer according to his market share, while the user has to take care of a business-to-business (B2B) product. If the product was put on the market after the date, then the producer is responsible for his individual (waste) product. Finally, Article 12(1) requires the member states to draw up a register of producers. The producers of the EEE have to register in the country where they are based and have to report in the registers the sales volume and the volume of collected and recovered products.¹⁵³

3.11. LATIN AMERICA

Most countries of Latin America still lag behind in drafting a legal framework for e-waste management. However, there have been some recent developments, for example in Costa Rica, the first country in the region to develop specific, national e-waste legislation. In terms of regional agreements, the Mercosur Policy Agreement of 2006 mandates its member states, Argentina, Paraguay, Uruguay and Brazil, to take national actions to ensure post-consumer responsibility

¹⁵² Available At <http://www.conformance.co.uk/adirectives/doku.php?id=wEEE> (last visited on April, 18, 20219).

¹⁵³ Rakesh Johri, *E-waste: Implications, regulations and management in India and current global best practices* 153 (TERI, New Delhi, 2008).

by producers and importers.¹⁵⁴ It is an attempt to introduce the concept of EPR as an environmental policy principle. In addition, the Organization of American States (OAS), at its conference in Santo Domingo in 2006, declared its readiness to prevent and mitigate negative effects associated with the use of ICT throughout the whole product life cycle. A regional platform for the management of waste from computers in Latin America and the Caribbean has recently been developed in partnership with the Swiss Government. In addition, the Central American Integration System (SICA) is developing a model waste law discussing possible common hazardous wastes rules for Central America, possibly including E-waste.¹⁵⁵

3.12. THE WAIGANI CONVENTION, 1995

The Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous Wastes within the South Pacific Region popularly known as Waigani Convention which signed in 1995 and entered into force in 2001. The Convention is designed to:

“Reduce or eliminate transboundary movements of hazardous and radioactive wastes into and within the Pacific Forum region; minimize the production of hazardous and toxic wastes in the Pacific Forum region; ensure that disposal of wastes is done in an environmentally sound manner and as close to the source as possible; and assist Pacific island countries that are Parties to the Convention in the environmentally sound management of hazardous and other wastes they generate.”¹⁵⁶

The Waigani Convention emerged as a radically weaker treaty in its prescriptions on hazardous waste than the 1991 Bamako Convention covering Africa. While the Bamako Convention explicitly includes radioactive and hazardous wastes in its definition of wastes to be covered by the convention, the Waigani

¹⁵⁴ Available At://www.E-waste_recycling_in_Latin_America_Overview_challe.p (last visited on October, 15, 2020).

¹⁵⁵ The Secretariat, *World forum on E-waste*, (UNEP, 2006).

¹⁵⁶ Available at: <https://sustainabledevelopment.un.org/partnership/?p=7456>(visited on October, 21, 2020).

Convention specifically omitted radioactive and hazardous waste from most of the provisions of the Convention other than Articles 4(1)-(3)¹⁵⁷ and 4(5).¹⁵⁸

In a region that had witnessed Japanese shipments of high-level radioactive waste and plutonium through South Pacific exclusive economic zones, and in the feared anticipation of a recurrence of radioactive waste shipments between Australia and either the Asian or North American mainland's, one would have expected a sterner outlook from the Waigani Convention.

Flowing from the foregoing analysis, global and regional policy and regulatory responses have predominantly focused on banning transboundary shipments of wastes. Even at that, the potential for the optimal enforcement of these regulatory responses is inherently weakened by a combination of factors.

It is regrettable that decades after these treaties were adopted; there are still recalcitrant states that have declined to become parties to them. The US, for one, has refused to accede to the Basel Convention, while only about half of the member states of the AU are parties to the Bamako Convention. The Waigani Convention has also not fared much better as otherwise eligible countries like France, Marshall Islands, United Kingdom and the United States have refused to join the Convention and Palau signed the treaty in 1995 without ratifying it.¹⁵⁹

Again, where these treaties were ratified, many states parties have not domesticated them as part of their municipal laws. The fall out is that these treaties are largely inadequately enforced, and have been mainly ineffective in both the sending and receiving countries. The stark reality of the ineffectiveness of treaties manifests when one remembers that international environmental law thrives on the mutual consent of states evidenced by multilateral treaties. In the absence of the ratifications by major exporting states, these treaties are bound to suffer.¹⁶⁰

¹⁵⁷ Convention on the Law of the Sea or the Protocol for the Prevention of Pollution of the South Pacific Region by Dumping, 1986.

¹⁵⁸ *Ibid.*

¹⁵⁹ Dejo Olowu, "Menace of E-Wastes in developing Countries: An agenda for legal and policy responses". 8/1 *Law, Environment and Development Journal* (2012). Available at: <http://www.lead-journal.org>. (Visited on October, 15, 2020).

¹⁶⁰ Article 11 of The Waigani Convention.

It therefore becomes inevitable, that if developing countries are to stem the tide of the menace of electronic wastes, alternative strategies must be developed. It is acknowledged that alternative solutions may include but are not limited to recycling technology transfer and increased manufacturer responsibility, although neither has been extensively effective in developing countries up till now. Beyond the non-ratification and non-domestication of relevant treaties lies another challenge: the tendency among some developing countries to enter into agreements to serve as recipient domains for wastes generated in the industrialised world, contrary to international prohibitory regimes.¹⁶¹

The above analysis of the sharp divergence in the approaches of the EU and the US to E-wastes not only provides an explanation as to why the US and EU have regulated the North–South hazardous waste trade in dissimilar ways, but also lend significant insight into current waste trade issues, most notably the management of electronic waste, and more importantly, the lack of global leadership on E-wastes as an environmental problem deserving urgent attention.¹⁶²

Beyond the initiatives discussed above, there have been concerted efforts at developing global and region-specific treaties on the menace of hazardous wastes in general and E-wastes in particular. It will assist a holistic analysis to examine some of the most pertinent frameworks at this juncture.

3.13. CONCLUSION

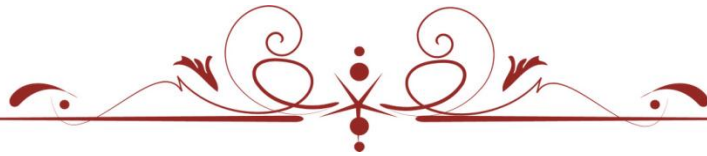
Electronic waste has become a huge problem for the world as we continue to grow the technology and become their slaves. If an instant action is not taken right away, it will continue to grow and will become a much bigger problem for the planet. Also, it has a massive bearing on environment and human life if not handled in an environmentally sound manner. There has to be sufficient rights for citizens to take legal recourse for damages caused to their health, environment and property. Therefore, it has become the necessity of the time to manage the electronic waste in an organized and safe manner with sustainable recycling technologies. There is a

¹⁶¹Duncan E.J. Currie, *The International Law of Shipments of Ultra-hazardous Radioactive Materials: Strategies and Options to Protect the Marine Environment* (Paper presented at the South Pacific Regional (Criminal Law and its Administration in International Environmental Conventions, Apia, Western Samoa, 22-26 June 1998). Available at: <http://www.lead-journal.org>.

¹⁶² Secretariat of the Pacific Regional Environment Programme, 2000.

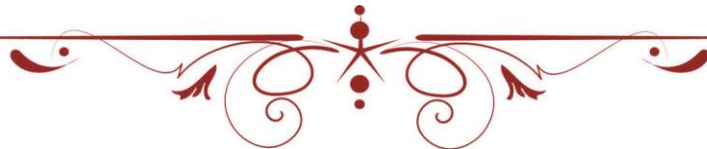
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need for stringent universal legal provisions and robust monitoring mechanisms to deal and match up with electronic waste of present times. It is imperative to have strict penalties like other countries analyzed here have because according to deterrence theory, people are most likely to be dispirited from committing a crime if the punishment is instantaneous, evident and severe. Also, there is a need to adopt effective strategy to encourage re-use, refurbishing or recycling of E-waste in specialized facilities to prevent environmental contamination and human health risks.



CHAPTER-IV

NATIONAL LEGAL FRAMEWORK ON E-WASTE MANAGEMENT



CHAPTER-IV

NATIONAL LEGAL FRAMEWORK ON E-WASTE MANAGEMENT

4.1. INTRODUCTION

The current Indian scenario of E-waste management is different from the worldwide. The practice of E-waste is a serious issue because of the informal recycling activities. Therefore, quantification of E-waste in India is very difficult and, there is no mechanism and policy to check the flow of E-waste in the system. India is the third biggest producer of E-waste in the world; As per the United Nations University report, 3.2 million tonnes of E-waste was generated in the country in 2019, a UN report have warned that the volume of global E-waste is likely to rise by 21 percent in next three years. In India E-waste collection, transportation, segregation, dismantling, recycling and disposal is done manually by untrained labours in informal sector. Due to low awareness and sensitization E-waste is thrown along with garbage which is collected and segregated by rag pickers. E-waste contains reusable and precious material. Rag pickers sell this E-waste to scrap dealers and run their livelihood. The scrap dealers supply the E-waste to recycling industries. The recyclers use old and hazardous technologies and equipment, to recycle/treat the E-waste.¹

Therefore, management and proper regulation of electronic waste has become a matter of great concern law and policy makers today because it has harmful and adverse impact on environment as well as human beings². In order to deal with this menace generation of electronic waste in India many environmental legislation and the rules were constituted which are dealing with E-waste either directly or indirectly. Nevertheless, such enactments have, unfortunately, not resulted in preventing environmental degradation as penal provisions in environmental laws dealing with electronic wastes.³

¹ Vanessa Forti, Cornelis P. Balde, et.al., *The Global E-waste Monitor 2020 Quantities, flows, and the circular economy potential* 74 (United Nations University, 2020).

² Florin Constantin Mihai (Ed.), *E-Waste in Transition: From Pollution to Resource* 32 (Intech Open USA, 2016).

³ Nivedita Chaudhary, "Electronic Waste in India: A Study of Penal Issues" 04 *ILI Law Review* (2018).

In this chapter, the researcher has analysed the laws relating to e-waste management in India like, the Environment (Protection) Act, 1986, the Municipal Solid Waste (Management and Handling) Rules, 2000, the Hazardous Waste (Management, Handling and Transboundary) Rules, 2003, The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008, The E-waste (Management and Handling) Rules, 2011, and The E-Waste (Management) Rules, 2016.

4.2. REGULATORY REGIME FOR E-WASTE

There are no specific environmental laws for the management and disposal of E-waste. None of the existing environmental laws has any direct reference to the electronic waste or its handling as hazardous in nature. However, there are several provisions in these laws which have been applied to various aspects of the electronic waste

1. The Environment (Protection) Act, 1986

This is an umbrella Act for the protection and improvement of environment and for matters connected, which provides that no person carrying on any industry, operation or process should discharge or emit or permit to discharged or emitted any environmental pollutant in excess of such standards as may be prescribed. This Act was provided for the protection and improvement of environment and for matters connected there with.⁴

The Act defines “Environment Pollution,” means the presence in the environment (environment 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) of any environmental pollutant (environmental pollutant means any solid, liquid or gaseous substance present in such concentration as may be or tend to be injurious to environment).⁵

⁴ ArunaVenkat *Environmental Law and Policy*, 250, (PHI Learning Pvt. Ltd, New Delhi Second Edition 2011).

⁵ Section, 2 (c) of The Environment (Protection) Act, 1986

NATIONAL LEGAL FRAMEWORK ON E-WASTE MANAGEMENT

The power of the Central Government to take measures to protect and improve environment⁶, (1) Planning and execution of a nation-wide programme for the prevention, control and abatement of environmental pollution; (2) collection and dissemination of information in respect of matters relating to environmental pollution; The Act thus acknowledges that dissemination of information is an important tool.⁷

The Act empowers any individual, to make a complaint before a Metropolitan Magistrate or a Judicial Magistrate of the first class of any offence under this Act after giving a notice of sixty days of his intention to make a complaint, to the Central Government or the authority or officer authorized⁸. The section 19 in the Act, however, fall short of provisions in section 49 of waster (Prevention and Control of Pollution) Act, 1974 and section 43 of Air (Prevention and Control of Pollution) Act, 1981 that provides for to make available the relevant reports in its possession to the person.

Which several rules relative to various aspects of management or hazardous chemicals, waters, etc., which have been notified. Under this Act, Central Government has rusticated, prohibited location of industries in different areas so as to safeguard the environment. Many standards for air emissions, discharge of effluent and noise have been evolved and notified. Subject to the provision of this Act, Central Government, which has the power to take all measures as it deemed necessary for the purpose of protection and improving the environment. Procedures, safeguards, prohibition and restriction on the handling of hazardous substances along with the prohibition and restriction on the location of industries in different areas have notified.⁹

The Environment (Protection) Act, 1986, which has no meaning or definition of electronic waste or e-waste in any way, but have the meaning and definition of the word hazardous substance in section 2 (e), under this Act. Hazardous substance, which means any substance or preparation which, by reason of its chemical or physico-chemical properties or handling, is liable to cause harm to human being, other

⁶ Section, 3 of The Environment (Protection) Act, 1986

⁷ S.C. Shastri, *Environmental Law*, 223 (Eastern Book Company, Lucknow 6th edn. 2018).

⁸ Section 19 of The Environment (Protection) Act, 1986

⁹ Divan Shyam, Armin Rosencranz., *Environmental Law and Policy in India: Cases, Materials and Statutes* 49 (Oxford University Press, New Delhi, 2nd Edition, 2001).

living creature, plant, micro-organism, property or the environment. In addition, there are some measures, which can use them for making, adapting or managing e-waste, as follow;¹⁰

- (i) The Rules to regulate environmental pollution. The Central Government may, by notification in the Official Gazette, make rules in respect of all or any of the matters referred to in section 3. In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters.¹¹
- (ii) The persons carrying on industry operation, etc., not to allow emission or discharge of environmental pollutants in excess of the standards, which no person carrying on any industry, operation or process shall discharge or emit or permit to be discharged or emitted any environmental pollutants in excess of such standards as may be prescribed.¹²
- (iii) The persons handling hazardous substance to comply with procedural safeguards, which no person shall handle or cause to be handled any hazardous substance except in accordance with such procedure and after complying with such safeguards as may be prescribed.¹³
- (iv) The furnishing of information to authorities and agencies in certain cases.¹⁴Under section 25 of this Act, power to make Rules.
- (v) The Rules made under this Act to be laid before Parliament, which every rule made under this Act shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive session, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or both Houses agree that the rule should not be made, the rule shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or

¹⁰ The Environment (Protection) Act, 1986.

¹¹ Section 6 of The Environment (Protection) Act, 1986.

¹² Section 7 of The Environment (Protection) Act, 1986.

¹³ Section 8 of The Environment (Protection) Act, 1986.

¹⁴ Section 9 of The Environment (Protection) Act, 1986.

annulment shall be without prejudice to the validity of anything previously done under the rule.¹⁵

Although this provision does not give meaning and definition of the term “electronic waste or e-waste” in any way and does not have measure for e-waste directly, but is regarded as a master of law used to issue notifications and rules come into force on electronic waste and hazardous waste , such as the Hazardous Wastes (Management and Handling) Rules, 1989, the Hazardous Wastes (Management and Handling) Amendment Rules, 2003, the Municipal Solid Wastes (Management and Handling) Rules, 2000, the Batteries (Management and Handling) Rules, 2001, the Hazardous wastes (Management , Handling and Transboundary Movement) Rules, 2008, the E-waste (Management and Handling) Rules, 2011, and the E-waste (Management) Rule, 2016 etc.

2. Hazardous wastes (Management and Handling) Rules, 1989

These Rules provide for environmentally sound management of hazardous waste. The Rule-3 (14) define “hazardous waste” as any waste which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or when in contact with other wastes and as listed in Schedule-1, Schedule-2 or Schedule-3 of these Rules.¹⁶

The Rule-5 (9) provides that every State Pollution Control Board or SPCB shall maintain a register containing particulars of the conditions imposed under these rules for any disposal of hazardous wastes, on any land or premises and it shall be open for inspection during office hours to any person interested of affected or a person authorized by him in this behalf.¹⁷

That environment impact assessment as per EIA notification, 1994 including a public hearing shall be carried out for the identification of hazardous wastes sites. It

¹⁵.Section 26 of The Environment (Protection) Act, 1986.

¹⁶.Rule 3 of the Hazardous wastes (Management and Handling) Rules, 1989.

¹⁷.Rule 5 of the Hazardous wastes (Management and Handling) Rules, 1989.

further lays down that an inventory of disposal sites within the State for the disposal of hazardous wastes shall be published periodically.¹⁸

The said Rules notified under the Environment (Protection) Act, 1986 thus provide for some sharing of information to public. Moreover, there are some important and interested points in this Rule, as follow;

- i) . Hazardous wastes have been categories in 18 categories.
- ii).Under this rule, project proponent handing hazardous waste must report to the concerned authorities regarding handling of waste, obtain authorization for handling waste, maintain proper records, file annual returns, label all packages, consignment etc., report any accident immediately in for report import-export of hazardous waste.
- iii).The Ministry of Environment and Forests or MOEF notified the Hazardous Waste (Management and Handling) Amendment Rules in January 6, 2000. Under this rule, toxic chemicals, flammable chemicals and explosive have been redefined to be termed as hazardous chemical.

3. The Batteries (Management and Handling) Rules, 2001

The Batteries (Management and handling) Rules, 2001 have been notified with primary to channelize the batteries generated in the country for environmentally sound recycling which is largely controlled by the un-organized sector who are adopting crude practices that results into higher pollution and less recovery, thereby causing wastages of precious resources and damage to environment.

The Batteries (Management and Handling) Rule, 2001, which has no meaning or definition of electronic waste or e-waste in any way, but has the meaning and definition of the terms “battery” and “used batteries¹⁹” means, which the battery and used batteries are considered the E-waste as well. Battery means lead acid battery which is a source of electrical energy and contains lead metal.

The Ministry of Environment and Forests or MOEF issued the Batteries (Management and Handling) Rules, 2001 for management and handling the problems

¹⁸ Rule 8 of the Hazardous wastes (Management and Handling) Rules, 1989.

¹⁹ Section 3and (r), The Batteries (Management and Handling) Rules, 2001.

of battery. Even though this rules, which can manage and control only the batteries, which is a type of E-waste but this Rules cannot manage and control all types of E-waste, sufficiently.

4. The Hazardous Waste (Management and Handling) Rules, 2003

In 1986, India enacted its first comprehensive environmental law, namely, the Environmental (Protection) Act, 1986 (EPA) after the Bhopal Gas tragedy and as a commitment under the Stockholm Conference in 1972. Section 3 of the Environment (Protection) Act, 1986, gives all- encompassing powers of setting standards, laying down procedures and supervision on the Central Government. The Rules under the EPA bestows upon the Union Government comprehensive powers to “take all such measures as is necessary or expedient for the purposes of protecting and improving the quality of environment and preventing, controlling and abating environmental pollution.”²⁰

In furtherance to the implementation of the objectives of the EPA, the Hazardous Waste (Management and Handling) Rules were enacted in 1989. It was felt that it was essential to have a dividing line between waste and by-product streams. Thus, the Rules had to have a definition of ‘waste’ or a detailed enumeration to assist classification. It classified hazardous waste into eighteen categories based on constituents present in it and the quantum of generation. These Rules were amended in the year 2000 primarily to bring them in line with the Basel Convention. The amendment made in the Rules in the year 2000 classified the waste by process of waste generation (Schedule-1) and as per their characteristics (Schedule-2). Classification of waste by ‘process of waste generation’ covers the hazardous wastes generated in the different industrial processes used and process variants. Thus, 44 categories were identified comprising 148 waste streams in Schedule-1 and 79 types of wastes in Schedule-2. The amendment made in the Rules in the year 2003 streamlined the list of processes/ waste streams in Schedule-1, whereby the number of industrial processes generating hazardous waste was reduced from 44 to 36 and the

²⁰ The Hazardous Waste (Management and Handling) Rules, 2003.

number of waste streams from 148 to 123. The Schedule-2 was essentially left unaltered.²¹

Bringing further amendments to the Hazardous Wastes (Management and Handling) Rules, 1989, the draft amendment Rules, 2002 were notified as “The Hazardous Wastes (Management and Handling) Rules, 2003” on 20 May 2003. Since E-waste or its constituents fall under the category of ‘hazardous’ and “non-hazardous waste,” they have been covered under its purview. As per the Rules, “hazardous waste” is defined as any waste which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or when in contact with other wastes or substances.¹⁶

There are some important features in Schedule 1, 2 and 3 which cover E-waste. Schedule 1 defines hazardous waste generated through different industrial processes. Although there is no direct reference of the electronic waste, the “disposal process” of E-waste could be characterized as hazardous processes²². The indicative list of these processes is:

- i) Secondary production and/or use of Zinc
- ii) Secondary production of copper
- iii) Secondary product of lead
- iv) Production and/or use of cadmium and arsenic and their compounds
- v) Production of primary and secondary aluminum
- vi) Production of iron and steel including other ferrous alloys (electric furnaces, steel rolling and finishing mills, coke oven and by product plan)
- vii) Production or industrial use of materials made with organo silicon compounds
Electronic industry

²¹ .The Hazardous Waste (Management and Handling) Rules, 2003.

²² *Ibid.*

viii) Waste treatment processes, e.g. incineration, distillation, separation and concentration techniques.

Schedule 2 lists waste substances which could be considered hazardous unless their concentration is less than the limit indicated in the said Schedule. E-waste or its fractions come broadly under this Schedule.²³

Schedule 3 mentions the list of hazardous waste to be applicable only for imports and exports. It has divided hazardous waste into two parts, A and B. Part A of the Schedule deals with two lists of waste to be applicable only for imports and exports purpose. Export and import of items listed in List A and B of Part A are permitted only as raw materials for recycling or reuse.²⁴

Wastes under List A are not allowed to be imported into the country without the Directorate General of Foreign Trade (DGFT) licence. However, E-waste is often imported in the name of reuse or recycling without any heed to the environmentally sound management of recycling.

5. The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008

In its endeavour to frame appropriate legislation for E-waste, the Central Government drafted the Hazardous Material (Management, Handling and Transboundary Movement) Rules, 2007 to prohibit transboundary movement of hazardous waste as envisioned by the Basel Convention, to which India is a signatory, on 24 September 2008, these Rules were notified as the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 by the Ministry of Environment and Forests in supersession of the Hazardous Wastes (Management and Handling) Rules, 1989 except in respect of things done or omitted to be done before such supersession. Supersession rules include directions for proper management and handling of hazardous wastes including electrical and electronic wastes. As per these Rules, every person desirous of recycling or reprocessing hazardous waste including electronics and electrical waste is required to register with

²³. Rakesh Johri, *E-waste: Implications, Regulations and Management in India and Current Global Best Practices*, 14 (The Energy and Resources Institute, 2008).

²⁴. Schedule II of The Hazardous Waste (Management and Handling) Rules, 2003.

the Central Pollution Control Board. The units handling E-waste are required to register with the CPCB.

The waste generated is required to be sent or sold to a registered or authorized re-cycler or re-processor or re-user having environmentally sound facilities for recovery of metals, plastics, etc. The CPCB has to be satisfied that an applicant for recycling or reprocessing waste is utilizing environmentally sound technologies and possesses adequate technical capabilities, requisite facilities and equipment to recycle, reprocess or reuse hazardous wastes, before granting registration to such applicants.²⁵

Under the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, the Ministry of Environment and Forests is the nodal Ministry to deal with the transboundary movement of the hazardous wastes and to grant permission for transit of the hazardous wastes through any part of India. It has placed import of hazardous waste items under three categories substances that can be imported with prior approval, free imports under Open General Licence and substances which are prohibited for importing into the country.²⁶ The first category includes metal and metal-bearing wastes of antimony, lead, galvanic sludge and waste lead acid batteries, whole or crushed. An importer is required to have a licence from the Directorate General of Foreign Trade. The list in the second category comprises materials such as iron, steel and zinc scrap; lead scrap except lead acid batteries; waste of copper and its alloys. The wastes listed in this category are traded under Open General Licence. The third category prohibits import of waste containing mercury, beryllium, arsenic, selenium, thallium, hexavalent chromium compounds, etc.²⁷

6. The E-waste (Management and Handling) Rules, 2010

Considering it necessary in the public interest to enable the recovery or reuse of useful material from E-waste, thereby reducing the hazardous wastes destined for disposal, and to ensure the environmentally sound management of all types of waste

²⁵ Rule 7, of The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008

²⁶ Rule 5, The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008

²⁷ Schedule VI of the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008.

electrical and electronic equipment, the Government introduced the draft E-waste (Management and Handling) Rules, 2010. After inviting objections/ suggestions from the stakeholders, the Ministry of Environment & Forests has finalized the draft modified E-waste (Management and Handling), Rules 2010 in September 2010 and put it on their website.²⁸ These Rules have not been notified and are likely to come into force w.e.f. 1 January 2012 and implemented through the State Governments/State Pollution Control Boards. Meanwhile the Department related Parliamentary Standing Committee on Industry functioning under the jurisdiction of the Chairman, Rajya Sabha, has exclusively taken up the subject of electronic wastes and Medium, Small and Micro Enterprises (MSMEs). It has heard the Secretary, MSME on the draft rules in its Meeting held on 20 December, 2010. It was felt by the Committee that the views of the MSME on the aforementioned rules are important as large numbers of medium enterprises are involved in the management and recycling of E-waste. The report the Committee is awaited.²⁹

A. Responsibilities

According to the modified draft notification put up in the MoEF website in September 2010, the rules shall apply to every producer, dealer, collection centre, refurbisher, dismantler, recycler, auctioneer, consumer or bulk consumer involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components.³³ The responsibilities of the various stakeholders have also been laid down in the Rules. What makes these Rules unique is the application of the singular concept of the Extended Producer's Responsibility.

According to the Rules,³⁰ the producers of electrical and electronic equipments including large and small household appliances, computers, toys, leisure and sports equipments, and medical devices shall be liable for collecting any E-waste generated during manufacture and will have to channelize the same for recycling or disposal. They will set up collection centres for E-waste generated from the 'end of life' products in line with the principle of the 'Extended Producer Responsibility' and ensure that such E-waste is channelized to a registered refurbisher or dismantler or

²⁸ E-waste (Management and Handling) Rules, 2010', Notification dated 14 May, 2010.

²⁹ Government of India, Report: *Evolve Road Map on Management of Wastes in India* (Ministry of Environment and Forests, 2010).

³⁰ E-waste (Management and Handling) Rules, 2010.

recycler. They have to ensure that all electrical and electronic equipments are provided with a unique serial number or individual identification code for product tracking in the E-waste management system. They shall also finance and organize a system to meet the costs involved in the environmentally sound management of E-waste generated from the 'end-of-life' of its own products and 'historical waste' available on the date from which the rules come into force. The producers will also have to provide contact details of dealers and authorized collection centres to consumers so as to facilitate return of E-waste.³¹

Dealers have to make provision for collecting E-waste by providing the consumer a box, bin or a demarcated area to deposit E-waste and ensure the same is transported back safely to the producer or the authorized collection centre. The dealers, refurbishers, dismantlers and recyclers have to get registered with the SPCB or CPCB, whichever may apply, and ensure that the storage, transport, dismantling and refurbishing of E-waste does not cause any adverse effect on health or environment. All the stakeholders have to register with the concerned SPCB or Pollution Control Committee (PCC), maintain records of the E-waste handled and also file annual returns in Form 3 to the concerned SPCB or PCC.³²

The Rules have also clearly stated the responsibilities of the consumers and bulk consumers. They have to ensure that E-waste is deposited with the dealers or authorized collection centre. They may also avail the pick-up or take back services provided by the producers. As per these Rules, any person operating a collection centre, individually or collectively, is required to obtain authorization from the SPCB or PCC concerned. To ensure E-waste management in an environmentally sound manner, they have to make certain that the storage system is secure and that the transportation to the producer, refurbisher or to the registered recycler is safe.

The proposed Rules, for the first time in India, bring in the concept of Extended Producer Responsibility, making manufacturers liable for safe disposal of electronic goods. It requires manufacturers to take back the products after their life is exhausted. It also aims to promote environment friendly designs in the making of electronic products that limit the use of hazardous chemicals like lead and mercury.

³¹. Rule 4 of The E-waste (Management and Handling) Rules, 2010.

³². *Ibid.*

Manufacturers will not only be made responsible for setting up collection centres to oversee the process, but have to also ensure that the hazardous products are handled by registered dismantlers or recyclers only in order to control any possible damage to the environment and human health. The draft policy would imply that bulk clients like banks, MNCs and other big companies would have to deposit their E-waste at authorized collection centres instead of selling them to local wholesale scrap shops. They would also have to file annual returns on the quantity of the E-waste disposed.³³

Notable among other rules is the inclusion of the Chapter on ‘Reduction in the use of Hazardous Substances (RoHS)’ in the manufacture of Electrical and Electronic Equipment. Every producer of electrical and electronic equipment will have to ensure that, new electrical and electronic equipment does not contain Lead, Mercury, Cadmium, Hexavalent Chromium, Polybrominated Biphenyls (PBB) or Polybrominated Diphenyl Ethers (PBDE).³⁴ Such reduction in use of hazardous substances would be achieved within a period of three years from the date of commencement of the new E-waste rules. The rule also provides for detailed information on the constituents of the equipment in the product information booklet. Further, imports or placement in the market for electrical and electronic equipment would only be permitted for those which are RoHS compliant.³⁵

However, the MoEF has stated that based on comments received and consultations held with stakeholders on the draft notification of E-waste (Management and Handling) rules, 2010, the final draft E-waste rules shall not apply to dealers and refurbishers. Further, producers have been made responsible for making arrangement of collection of E-waste generated from their end of life products.

B. Government assistance for Treatment, Storage and Disposal Facilities (TSDFs).

The Government has taken a number of initiatives to address issues related to disposal of wastes. It encourages setting up of integrated Treatment, Storage and Disposal Facility (TSDFs) for hazardous waste management on Public Private

³³ . Rule 5 of The E-waste (Management and Handling) Rules, 2010.

³⁴ . Rule 15 of The E-waste (Management and Handling) Rules, 2010.

³⁵ . Press Release: ‘The e-waste industry in India: CSE exposes what lies beneath’, 18 May, 2010, <<http://www.cseindia.org/>>

Partnership (PPP) mode in clusters of hazardous waste generating industries. So far 28 TSDFs have been set up. The Ministry of Urban Development is implementing the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) for providing assistance to the State Governments/ Urban Local Bodies for various projects including solid waste management.³⁶

On the basis of proposals received from the States, the Centre has provided financial assistance to the State Pollution Control Boards for setting up of integrated TSDFs. To offset any possibility of the amount allocated for setting up of the TSDFs getting diverted for other activities or projects, a Memorandum of Understanding (MoU) is signed between the Ministry of Environment and Forests, State Pollution Control Board and the entrepreneur before release of financial assistance for setting up of TSDF. One of the conditions of the MoU is to constitute a committee to monitor progress of the facility. Further release of financial assistance is made only on submission of audited Utilization Certificate and physical progress report by the respective State Pollution Control Board.

7. E-waste (Management and Handling) Rules, 2011

The E-waste (Management & Handling) Rules, 2011 have been notified with primary objective to channelize the E-waste generated in the country for environmentally sound recycling which is largely controlled by the un-organized sector who are adopting crude practices that results into higher pollution and less recovery, thereby causing wastages of precious resources and damage to environment.³⁷

Objectives and scope of the guidelines: MoEF/CPCB after consulting various stake holders felt the need for preparing a guidance document for implementation of the provisions of the E-Waste (Management & Handling) Rules, 2011 that may help the Producers, Consumer & Bulk Consumer, Collection Center, Dismantler, Recycler and Regulatory agencies for effective compliance/implementation of these rules. This document also provides guidance on setting up collection mechanism, dismantling and recycling operations. As the E-waste Rules place main responsibility of E-waste

³⁶ *Supra note.35*

³⁷ E-Waste (Management & Handling) Rules, 2011.

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management on the producers of the electrical and electronic equipment by introducing the concept of “extended producer responsibility.” The scope of implementing such EPRs is also discussed in these guidelines.

The E-waste (Management & Handling) Rules, 2011 have been notified in May 2011 and are effective from 1st May 2012. These rules were notified in advance to give the various stakeholders adequate time to prepare themselves and also to place the required infrastructure for the effective implementation of these rules. It has applicability, as follow;

- i. These rules shall apply to every producer, consumer or bulk consumer, collection centre, dismantler and recycler of E-waste involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components as specified in schedule- I the regulatory agencies involved are SPCB and CPCB.³⁸
- ii. The rule will not apply to lead acid batteries as covered under the Batteries (Management and Handling) Rules, 2001. The rules shall not apply to, Micro and Small enterprises as defined in the Micro, Small and Medium Enterprises Development Act, 2006 and radio-active wastes as covered under the provisions of the Atomic Energy Act, 1962 and rules made there under. The Ministry of Micro Small and Medium Enterprises has awarded a study to ‘The Energy and Resources Institute’ (TERI) to examine the quantum of E-waste generated and the management of e-waste from the products manufactured by them at the end of life. The study is likely to be completed in three months. Based upon the finding of the study, the matter regarding the inclusion of Micro and Small Enterprises would be reviewed.³⁹
- iii. The e-waste Rules apply to all electrical and electronic equipment (EEE) listed in Schedule 1 (annexure-IV) and put on market in India, including their components and consumables which are part of the product at the time of discarding.

³⁸ Section 2(a) of The E-Waste (Management & Handling) Rules, 2011.

³⁹ . Section 2 of The E-Waste (Management & Handling) Rules, 2011.

- iv. The rules also call for the reduction in the use of hazardous substances in electrical and electronic equipment. Every producer of equipment listed in Schedule 1 of the Rule shall ensure that the covered products do not contain lead, mercury, cadmium, hexavalent chromium, poly-brominated biphenyls or poly-brominated di-phenyl ethers above a specified threshold. The threshold for cadmium is 0.01% by weight in homogeneous material, for all other substances, the threshold is 0.1% by weight in homogeneous material.
- v. In case of any doubt regarding applicability of these rules the matter would be referred to an inter-ministrial committee comprising of technical experts and industry representatives.
- vi. Equipment or system that is not listed in Schedule-I but has a part or component that is listed in Schedule-I as an integral part of that equipment or system is considered to be outside the scope of the rules. However, waste generated from such components or parts may be accepted for channelization to recycling facility as long as it is recyclable.

A. Implementation of Extended Producer's Responsibility

Extended producer's responsibility (EPR) is the main feature of the E-waste (Management and Handling) Rules, 2011, wherein the producer of electrical and electronic equipment has the responsibility of managing such equipment after its 'end of life', thus the producer is responsible for their products once the consumer discards them. Under this EPR, producer is also entrusted with the responsibility to finance and organize a system to meet the costs involved in complying with EPR.⁴⁰

Most of the E-waste models around the world are based on these concepts which motivate the producers to reduce consumption of virgin materials, undertake product design changes to reduce waste generation and ensure closure of material loops to promote resource efficiency and sustainable development.⁴¹

⁴⁰ Section 4 of The E-Waste (Management & Handling) Rules, 2011.

⁴¹ *Ibid.*

B. Collection Centre

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 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 or warehouse where the E-Waste collected from consumers, bulk consumers, urban local bodies and retail collection points etc. established by producers or collection centres, can be received and stored safely for necessary channelization for dismantling or recycling.⁴²

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. These guidelines suggest the following options and requirements for setting up Collection Centres.⁴³

C. Criteria for setting up Collection centres

E-waste in itself may not pose any threat to human health and environment till the point it is dismantled. However broken equipment can be a potential safety hazard for those engaged in handling and transporting E-waste. Care should be taken for proper packaging for any such equipment during the storage/ transportation. Sufficient additional measures, including training, may be taken to safeguard occupational and environmental health and safety.⁴⁴

⁴² Section 4 (1) of The E-Waste (Management & Handling) Rules, 2011.

⁴³ Section 4(3) of The E-Waste (Management & Handling) Rules, 2011.

⁴⁴ Section 5 of The E-Waste (Management & Handling) Rules, 2011.

D. Environmentally Sound Dismantling and Recycling of E-waste

The E-Waste comprising of IT &TE listed in Schedule-I(Annexure IV) including TVs can contain up to 60 different elements of which some are valuable, some are hazardous/toxic and some are both. Printed Circuit Board (PCB) commonly called as motherboard or printed wire board (PWB) contains a complex mix of elements and needs a very careful handling for recovery of precious metals and for minimizing impact on the environment during recovery process. The electrical and electronic equipments require very large amounts of non-ferrous/precious/semi-precious metals and are among the major contributors to the demand for non-ferrous/precious/semi-precious metals in the world. The substances within the components of electrical and electronic equipment which have adverse impact on the environment are lead, mercury, cadmium, chromium (VI), halogenated substances (CFCs), polychlorinated biphenyls and polybrominated diphenyl ethers. Plastics and printed circuit board contains brominated flame retardants (BFRs). BFRs can give rise to dioxins and furans during incineration. Recoveries of these non-ferrous, precious, semiprecious metals from E-waste, if not done in a scientific and environmental friendly manner, will result in large emissions of hazardous substances into the environment. In view of this, environmentally sound recycling of E-waste is a must. Environmentally sound recycling with best available technology will lead to efficient recovery of non-ferrous, precious, semi-precious metals and will have low greenhouse gas emissions compared to extraction of these metals from ores. Urban mining of E-waste and recoveries of nonferrous, precious, semiprecious metals needs significantly low energy compared to recoveries from ore.⁴⁵

Environmentally sound recycling or re-processing of E-waste starts with decontamination or dismantling where the concentration of hazardous material/chemical is reduced followed by recycling and recovery of the material of economic value and then disposal of the residue in TSDF (Treatment, storage and Disposal facility). The second category equipment like refrigerators, air conditioners and washing machines primarily contain steel plastics and copper wiring. It also contains potentially harmful substance such as CFCs/HCFCs gases which have high ozone depletion potential. The compressor oils are hazardous waste that need proper disposal at TSDFs or can be

⁴⁵ Section 8 of The E-Waste (Management & Handling) Rules, 2011.

processed in cement kilns. Environmentally sound recycling is required to ensure safe collection and disposal of these substances.⁴⁶

Dismantler As per these rules any person or registered society or a designated agency or a company or an association can engage in dismantling of end of life electrical and electronic equipments into their components by obtaining registration and authorization from the respective SPCB. Dismantling operation can be manual, semi manual and automatic involving physical segregation operations for plastics, glass, steel, non-ferrous material, wires, gases, liquids and printed circuit boards. Dismantlers may perform the following operations. The major objective of hammering and shredding operations is size reduction and separation of steel, plastics, PCBs, non-ferrous metals, glass etc. Fractions such as plastic, ferrous and nonferrous material, glass are sent to secondary recycling industry while other remaining fractions are sent to registered E-Waste Recyclers for treatment and recovery. Dismantling operations are a dry process that may cover the following operations.⁴⁷

E. Space requirement for Dismantler

Adequate and separate space is required for storage of raw material, segregated material and dismantling operations, office or administration and other utilities.

F. Regulatory Requirement for Dismantles

The regulatory requirement for dismantlers, which have to comply with following legal requirement.

a. Recyclers

As per these rules⁴⁸ any person who is engaged in recycling or reprocessing of used electrical and electronic equipment or as sembalies or their component is a recycler. Recyclers may also set up their own authorized collection centres and may establish linkages with producers, bulk generators and other collection agencies. They

⁴⁶ Section 8 (b) of The E-Waste (Management & Handling) Rules, 2011.

⁴⁷ Section 7 of The E-Waste (Management & Handling) Rules, 2011.

⁴⁸ Section 8 of The E-Waste (Management & Handling) Rules, 2011.

may also establish a scheme for household collection of e-waste or may establish tie-ups with other agencies involved in collection of e-waste from individual consumers.

The output material after dismantling and segregation of mild steel, aluminium, Hg Switches, batteries, capacitors, plastic components, CRT, printed circuit board (plain or shredded), cables etc. can be further re-processed or recycled for refinement or enrichment or recovery of useful components that can be used as supplementary raw material for production of new materials including electronic components.

The functions of the recycling facilities are similar to the dismantlers but implements high degree technologies for recycling or recovery operations. There shall be no restriction on degree of operations that can be permitted for recyclers. The following processes can be employed by recyclers, as follow manual, semi-manual ,automatic dismantling operations, shredding, crushing, grinding, enrichment operations, pyro metallurgical operations, smelting furnace, hydro metallurgical operations, electro-weaning, CRT cutting, toner cartridge recycling, melting, casting, moulding operations (for metals and plastics).

b. Space requirement for Recyclers

Adequate and separate space is required for storage of raw material, segregated material and dismantling and recycling operations, office or administration and other utilities.⁴⁹

G. Regulatory Requirement for Recyclers

The recycler has to comply with following legal requirement.

a. Bulk Consumers

Departments of Central/State Government, public sector undertaking, banks, educational institution, multinational organizations, international agencies and private companies that are registered under the Factories Act, 1948 and Companies Act, 1956 are called as Bulk Consumers. As per these rules a bulk consumer has to ensure that the E-waste generated by them have to be channelized to authorized collection centres

⁴⁹ Section 8(2) of The E-Waste (Management & Handling) Rules, 2011.

or registered dismantler or recycler or is returned to the producer through its pick up or take back services or through its collection points. The bulk consumer has to maintain records of E-waste generated by them in Form 2 and make such records available for scrutiny to SPCBs/PCCs whenever demanded.

b. Role of State Pollution Control Boards

SPCB shall ensure that Producer having their manufacturing facility in their State obtain authorization.⁵⁰

c. Interstate Transportation

Transportation of E-waste, being sent for dismantling or recycling to a facility in a State other than the State, where it is generated or collected, does not require 'No objection certificate' from the SPCBs/PCCs concerned.

However, Transporter of the E-waste is required to give prior intimation to the SPCBs/PCCs concerned i.e. the States in which the E-waste is generated, transited and being sent for the purpose of recycling or dismantling.⁵¹

8. The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2015

The hazardous and other wastes (Management and Transboundary Movement) Rule, 2015, which notified⁵² by Ministry of Environment, Forest and Climate Change The Central Government considers it necessary in the public interest and to address sustainable development concerns, to review the rules publish earlier, to enable the recovery and reuse of useful material from hazardous and other waste materials generated from a process, thereby, reducing the hazardous and other wastes destined for final disposal and to ensure the environmentally sound management of all hazardous and other waste materials.

⁵⁰ Section 9 (1) of The E-Waste (Management & Handling) Rules, 2011.

⁵¹ Section 9 (8) of The E-Waste (Management & Handling) Rules, 2011.

⁵² Dated the 24th July, 2015 in the Gazette of India.

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These Rules provide for environmentally sound management of hazardous wastes. The “hazardous waste”⁵³ means any waste which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or which contact with other wastes or substances, and shall include;

- i. waste specified under column (3) of Schedule I
- ii. waste having equal to or more than the concentration limits specified for waste constituents in class A and class B of Schedule II or any of the characteristics as specified in class C of Schedule II, and wastes specified in Part A of Schedule III in respect of import or export of such wastes or the wastes other than those specified in Part A if they possess any of the hazardous characteristics specified in Part C of Schedule III.

There are a lot of the Rules of the Hazardous Wastes (Management Handling and Transboundary Movement) Rules, 2008, which have been added, changed and removed as follow:

any person intending to export other wastes specified in Part B of Schedule III shall do so subject to availability of following documents duly verified by the custom authority, namely;⁵⁴

- (a) Valid Consent to Operate under the Water Act, 1974 and the Air Act, 1981;
- (b) valid authorisation under these rules or under the e-waste (Management and Handling) Rules, 2011 in case of E-waste;
- (c) Registration for recycler or dismantler under e-waste (Management and Handling) Rules, 2011; insurance policy covering liability to health and environment during transit.
- (d) The Rule 15 (2), (3), (6), (8), (12), (13) and (14), procedure for import of hazardous wastes and other wastes;⁵⁵

⁵³ .Rule 3 (1) of The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2015.

⁵⁴ Rule 14 (2) of The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2015.

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2. Actual users for recycling or reprocessing may import into the country other wastes listed in Part B of Schedule II, if such user is authorised by the State Pollution Control Board, has the Directorate General of Foreign Trade license, wherever applicable and the relevant documents have been verified by the Customs authorities: Provided that the documentation requirement for specific kind of waste shall be specified by the Ministry of Environment, Forest and climate Change from time to time;

3. The user referred to in sub-rule (2) shall submit the application in Form 6 to concerned State Pollution Control Board to enable them to maintain the annual record of import as per the authorisation granted by them.⁵⁶

Prior to clearing of consignment of other wastes, the Customs authorities shall verify;

- (i) the acknowledgement from concerned State Pollution Control Boards.
- (ii) the authorisation under these rules along with Inspection Report indicating the compliance as per the prescribed Standard Operating Procedure or guidelines, as the case may be;
- (iii) the valid Consent to Operate under the Water Act, 1974 and/or the Air Act, 1981;

Provided that the provisions of this sub-section shall not be applicable to import of electrical and electronic assemblies for re-use purpose covered under Basel numbers, B1110 as specified in Part B of Schedule III.

1. The Port or Customs authorities shall, in case of import of other wastes as specified in Part B of Schedule III, ensure that shipment is also accompanied by Movement Document in Form 7 and pre shipment inspection certificate issued by the inspection agency certified by the exporting country or the inspection and certification agency approved by the Directorate General of Foreign Trade.⁵⁷

⁵⁵ The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2015

⁵⁶ Rule 14 (2) of The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2015.

⁵⁷ Rule 13 of The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2015.

Therefore, the hazardous and other wastes (Management and Transboundary Movement) Rules, 2015, which has been changed, added and removed some rules to make and develop this Rules clearly in meaning and definition of hazardous and other waste, which include E-waste. Moreover, this Rule have developed chapter III (import and export of hazardous and other wastes) to manage and control for importing and exporting of hazardous and other waste, which include E-waste, and this Rules enables the Customs to inspect and control about export and import of hazardous waste and other wastes too.

9. The Hazardous and other wastes (Management and Transboundary Movement) Rules, 2016

India has banned the import of solid plastic waste, including PET bottles, as part of new hazardous waste management rules that aims to prevent the country from becoming a dumping yard for industrialised nations. The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 notified⁵⁸ by the Union environment ministry on Sunday replaces its older version made in 2008. The new rules distinguish hazardous waste from others such as waste tyre, paper waste, metal scrap and used electronic items. The rules recognise the latter as a resource for recycling and reuse supplementing industrial processes, thereby reducing the load on the country's resources.

Among other items banned for import are waste edible fats and oil of animals, household waste, tyres for direct re-use purpose, solid plastic wastes, including PET bottles, waste electrical and electronic assemblies scrap and other chemical wastes especially in solvent form. "PET bottles are used by the fibre industry in India and import of plastic waste (PET bottles) is preferred because that ensures bulk availability. But India itself has a huge amount of plastic waste including PET bottles that remain uncollected and harm environment. These rules will ensure their collection and reduce load on our pollution," said a senior environment ministry official, who did not wish to be named.

The official added that industrialised countries like the US also do not allow importing plastic waste. "The new hazardous waste rules will ensure resource

⁵⁸ Dated the 24th July, 2015 in the Gazette of India.

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recovery and disposal of hazardous waste in an environmentally sound manner. The rules are environment and industry-friendly. The provisions of the new rules are in line with this government's priority for Ease of Doing Business and Make in India, but with responsible concerns for sustainable development," said Union minister for environment, forest and climate change Prakash Javadekar.⁵⁹

Metal scrap, paper waste and various categories of electrical and electronic equipment for re-use purpose; however, can be imported without permission from the environment ministry. Hazardous waste includes material like lead acid battery scrap, used oil, waste oil and spent catalysts. According to the Central Pollution Control Board, total hazardous waste generation in India in 2015 was 7.46 million metric tonnes from about 44,000 industries.

Unscientific disposal of hazardous and other waste through burning or incineration leads to emission of toxic fumes comprising mercury, heavy metals, causing air pollution and associated health-related problems. Disposal in water bodies or municipal dumps leads to leaching of toxic substances in land and water, degrading soil and water quality. The rules make state governments responsible for environmentally sound management of hazardous and other wastes and mandate them to set up industrial space or sheds for recycling, pre-processing and other utilization of hazardous or other waste.

The state authorities have also been asked to register the workers involved in recycling, undertake industrial skill development activities and ensure safety and health of workers. States must also submit annual reports regarding implementation of these rules to environment ministry. This is because workers employed in unscientific hazardous waste management practices suffer from neurological disorders, skin diseases, genetic defects and cancer. The rules also mandates the state pollution control boards to prepare an annual inventory of the waste generated, recycled, recovered, utilised including co-processed, waste re-exported and waste disposed.⁶⁰

⁵⁹ Available At: <https://www.livemint.com/Politics/vwPqUaA0Wma4dAic85QdqI/Government-notifies-new-hazardous-waste-management-rules.html>. (visited on September, 11, 2020).

⁶⁰ <http://toxicslink.org/?q=article/government-notifies-new-hazardous-waste-management-rules> (visited on October, 15, 2020).

“The new Hazardous Waste Rules will ensure resource recovery and disposal of hazardous waste in environmentally sound manner. The Rules are environment and industry- friendly. The provisions of the new Rules are in line with this Government’s priority for Ease of Doing Business and Make in India, but with responsible concerns for sustainable development”, Minister of State (Independent Charge) of Environment, Forest and Climate Change, Shri Prakash Javadekar, said here today, while releasing the HW Rules, 2016.

For the first time, Rules have been made to distinguish between Hazardous Waste and other wastes. Other wastes include: Waste tyre, paper waste, metal scrap, used electronic items, etc. and are recognized as a resource for recycling and reuse. These resources supplement the industrial processes and reduce the load on the virgin resource of the country.

10. E-waste Management and Handling Rules 2016

The primary objective of these rules is to channelize the E-waste generated in the country to make the recycling of the E-waste in environmentally sound manner. The concept of extended producer responsibility is introduced in these rules by placing the main responsibility of E-waste management on the producer of the electrical and electronic equipment. These rules had notified by MPCB in February 2016 and get implemented from 1st October, 2016.⁶¹ These rules are applicable to every producer, consumer involved in the manufacture, sales purchase, and processing of electrical and electronic equipment or components, collection centres, dismantlers and recyclers of E-waste comes under this law.⁶²

The law is also applicable on the people involved in purchase and processing of electrical and electronic equipment or components. The rules prescribe a waste collection target of 30 percent waste generated under EPR for the first two years, progressively going up to 70 percent in the seventh year of the rule. The rules prescribe stringent financial penalties for non-compliance.

⁶¹ Rule 1 Sub rule 2 of The E-Waste (Management) Rules, 2016.

⁶² Rule 2 of The E-Waste (Management) Rules, 2016.

a. Responsibilities of the Manufacturer/Producer.⁶³

(1) Collect E-waste generated during the manufacture of any electrical and electronic equipment and channelize it for recycling or disposal;

(2) Apply for an authorization in Form 1 (a) in accordance with the procedure prescribed from the concerned State Pollution⁶⁴

Control Board, which shall give the authorization in accordance with Form 1 (bb);

(3) ensure that no damage is caused to the environment during storage and transportation of E-waste;

(4) Maintain records of the E-waste generated, handled and disposed in Form-2 and make such records available for scrutiny by the concerned State Pollution Control Board;⁶⁵

(5) File annual returns in Form-3, to the concerned State Pollution Control Board on or before the 30th day of June following the financial year to which that return relates.⁶⁶

The producer of electrical and electronic equipment listed in **Schedule I** shall be responsible for;⁶⁷

(1) Implementing the Extended Producers Responsibility with the following frameworks, namely:-

(a) Collection and channelization of E waste generated from the End-of-life of their products of end- of- life products with some electrical and electronic equipment code and historical waste available on the date from which these

⁶³ Rule 3 (z) of The E-Waste (Management) Rules, 2016.

⁶⁴ Rule 13 Sub rule 2 of The E-Waste (Management) Rules, 2016.

⁶⁵ Rule 4 Sub rule 4 of The E-Waste (Management) Rules, 2016.

⁶⁶ Rule 4 Sub rule 5 of The E-Waste (Management) Rules, 2016.

⁶⁷ Rule 5 of The E-Waste (Management) Rules, 2016.

rules come into force as per Schedule I in line with the targets prescribed in Schedule III in Extended Producer Responsibility - Authorisation;⁶⁸

(b) The mechanism used for channelization of e waste from end-of-life products including those from their service centres to authorized dismantler or recycler shall be in accordance with the Extended Producer Responsibility - Authorisation. In cases of fluorescent and other mercury containing lamps, where recyclers are not available, and channelization may be from collection centre to Treatment, Storage and Disposal Facility;⁶⁹

(c) For disposal in Treatment, Storage and Disposal Facility, a pre-treatment is necessary to immobilise the mercury and reduce the volume of waste to be disposed off.⁷⁰

(d) Extended Producer Responsibility - Authorisation should comprise of General scheme for collection of waste Electrical and Electronic Equipment from the Electrical and Electronic Equipment placed on the market earlier, such as through dealer, collection centres, Producer Responsibility Organisation, through buy-back arrangement, exchange scheme, Deposit Refund System, etc. whether directly or through any authorised agency and channelizing the items so collected to authorised recyclers;⁷¹

(e) Providing contact details such as address, E-mail address, toll-free telephone numbers or helpline numbers to consumers or bulk consumers through their website and product user documentation so as to facilitate return of end-of-life electrical and electronic equipment;⁷²

(f) Creating awareness through media, publications, advertisements, posters, or by any other means of communication and product user documentation accompanying the equipment, with regard to-⁷³

⁶⁸ Rule 5 Sub rule 1 (a) The E-Waste (Management) Rules, 2016.

⁶⁹ Rule 5 Sub rule 1 (b) The E-Waste (Management) Rules, 2016.

⁷⁰ Rule 5 Sub-rules 1 (c) of The E-Waste (Management) Rules, 2016.

⁷¹ Rule 5 Sub rule 1 (d) of The E-Waste (Management) Rules, 2016.

⁷² Rule 5 Sub-rule 1 (e) of The E-Waste (Management) Rules, 2016.

⁷³ Rule 5 Sub rule 1 (f) of The E-Waste (Management) Rules, 2016.

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- i. Information on address, e-mail addresses, toll-free telephone numbers or helpline numbers and web site;
- ii. Information on hazardous constituents as specified in sub-rule 1 of rule 16 in electrical and electronic equipment;
- iii. Information on hazards of improper handling, disposal, accidental Breakage, damage or improper recycling of E-waste;
- iv. Instructions for handling and disposal of the equipment after its use, along with the
- v. Affixing a visible, legible and indelible symbol given below on the products or product user documentation to prevent E-waste from being dropped in garbage bins containing waste destined for disposal;
- vi. Means and mechanism available for their consumers to return E-waste for recycling including the details of Deposit Refund Scheme, if applicable;

(g) The producer shall opt to implement Extended Producer Responsibility individually or collectively. In individual producer responsibility, producer may set up his own collection centre or implement take back system or both to meet Extended Producer Responsibility. In collective system, producers may tie-up as a member with a Producer Responsibility Organization or with E-waste exchange or both.⁷⁴

(2) To provide information on the implementation of deposit refund scheme to ensure collection of end-of-life products and their channelization to authorised dismantlers or recyclers, if such scheme is included in the Extended Producer Responsibility Plan. Provided that the producer shall refund the deposit amount that has been taken from the consumer or bulk consumer at the time of sale, along with interest at the prevalent rate for the period of the deposit at the time of take back of the end-of life product;⁷⁵

(3) The import of electrical and electronic equipment shall be allowed only to producers having Extended Producer Responsibility authorisation;⁷⁶

(4) Maintaining records in Form-2 of the E-waste handled and make such records available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board;⁷⁷

⁷⁴ Rule 5 Sub rule 1 (g) of The E-Waste (Management) Rules, 2016.

⁷⁵ Rule 5 Sub rule 2 of The E-Waste (Management) Rules, 2016.

⁷⁶ Rule 5 Sub rule 3 of The E-Waste (Management) Rules, 2016.

(5) Filing annual returns in Form-3, to the Central Pollution Control Board on or before the 30th day of June following the financial year to which that return relates. In case of the Producer with multiple offices in a State, one annual return combining information from all the offices shall be filed;⁷⁸

(6) The Producer shall apply to the Central Pollution Control Board for authorisation in form 1, which shall thereafter grant the Extended Producer Responsibility -

Authorisation in Form 1(aa).⁷⁹

(7) Operation without Extended Producer Responsibility-Authorisation by any producer, as defined in this rule, shall be considered as causing damage to the environment.⁸⁰

b. Responsibilities of the Collection centres

(1) Collect E-waste on behalf of producer or dismantler or recycler or re furbisher including those arising from orphaned products; provided the collection centres established by producer can also collect E-waste on behalf of dismantler, re furbisher and recycler including those arising from orphaned products.⁸¹

(2) Ensure that the facilities are in accordance with the standards or guidelines issued by Central Pollution Control Board from time to time;⁸²

(3) Ensure that the E-waste collected by them is stored in a secured manner till it is sent to authorised dismantler or recycler as the case may be;⁸³

(4) Ensure that no damage is caused to the environment during storage and transportation of E-waste;⁸⁴

(5) Maintain records in Form-2 of the E-waste handled as per the guidelines of

⁷⁷ Rule 5 Sub rule 4 of The E-Waste (Management) Rules, 2016.

⁷⁸ Rule 5 Sub rule 5 of The E-Waste (Management) Rules, 2016.

⁷⁹ Rule 5 Sub rule 6 of The E-Waste (Management) Rules, 2016.

⁸⁰ Rule 5 Sub rule 7 of The E-Waste (Management) Rules, 2016.

⁸¹ Rule 6 Sub rule 1 of The E-Waste (Management) Rules, 2016.

⁸² Rule 6 Sub rule 2 of The E-Waste (Management) Rules, 2016.

⁸³ Rule 6 Sub rule 3 of The E-Waste (Management) Rules, 2016.

⁸⁴ Rule 6 Sub rule 4 of The E-Waste (Management) Rules, 2016.

Central Pollution Control Board and make such records available for scrutiny by the Central

Pollution Control Board or the concerned State Pollution Control Board as and when asked for.⁸⁵

c. Responsibilities of the Dealers.

- (2) In the case the dealer has been given the responsibility of collection on behalf of the producer, the dealer shall collect the E- waste by providing the consumer a box, bin or a demarcated area to deposit E-waste or through take back system and send the E-waste so collected to collection centre or dismantler or recycler as designated by producer;⁸⁶
- (3) The dealer or retailer or E-retailer shall refund the amount as per take back system or Deposit Refund Scheme of the producer to the depositor of E-waste;⁸⁷
- (4) Every dealer shall ensure that the E-waste thus generated is safely transported to authorised dismantlers or recyclers;⁸⁸
- (5) Ensure that no damage is caused to the environment during storage and transportation of E-waste.⁸⁹

d. Responsibilities of the Refurbisher.

- (1) Collect E-waste generated during the process of refurbishing and channelize the waste to authorised dismantler or recycler through its collection centre;⁹⁰
- (2) Make an application in Form 1(a) in accordance with the procedure laid down in sub-rule (4) of rule 13 to the concerned State Pollution Control Board for grant of one time authorisation;⁹¹

⁸⁵ . Rule 6 Sub rule 5 of The E-Waste (Management) Rules, 2016.

⁸⁶ . Rule 7 Sub rule 1 of The E-Waste (Management) Rules, 2016.

⁸⁷ . Rule 7 Sub rule 2 of The E-Waste (Management) Rules, 2016.

⁸⁸ . Rule 7 Sub rule 3 of The E-Waste (Management) Rules, 2016.

⁸⁹ Rule 7 Sub rule 4 of The E-Waste (Management) Rules, 2016.

⁹⁰ Rule 8 Sub rule 1 of The E-Waste (Management) Rules, 2016.

⁹¹ Rule 8 Sub rule 2 of The E-Waste (Management) Rules, 2016.

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- (a) The concerned State Pollution Control Board shall authorise the Refurbisher onetime basis as per Form 1 (bb) and authorisation would be deemed as considered if not objected to within a period of thirty days;
 - (b) The authorised Refurbisher shall be required to submit details of E-waste generated to the concerned State Pollution Control Board on yearly basis;
- (3) ensure that no damage is caused to the environment during storage and transportation of E-waste;⁹²
- (4) Ensure that the refurbishing process do not have any adverse effect on the health and the environment;⁹³
- (5) ensure that the E-waste thus generated is safely transported to authorized collection centres or dismantlers or recyclers;⁹⁴
- (6) File annual returns in Form-3 to the concerned State Pollution Control Board, on or before the 30th day of June following the financial year to which that return relates;⁹⁵
- (7) Maintain records of the E-waste handled in Form-2 and such records should be available for scrutiny by the appropriate authority.⁹⁶

e. Responsibilities of the Consumer or bulk consumer.

- (1) consumers or bulk consumers of electrical and electronic equipment listed in Schedule I shall ensure that E-waste generated by them is channelized through collection centre or dealer of authorised producer or dismantler or recycler or through the designated take back service provider of the producer to authorised dismantler or recycler;⁹⁷

⁹² Rule 8 Sub rule 3 of The E-Waste (Management) Rules, 2016.

⁹³ Rule 8 Sub rule 4 of The E-Waste (Management) Rules, 2016.

⁹⁴ Rule 8 Sub rule 5 of The E-Waste (Management) Rules, 2016.

⁹⁵ Rule 8 Sub rule 6 of The E-Waste (Management) Rules, 2016.

⁹⁶ Rule 8 Sub rule 7 of The E-Waste (Management) Rules, 2016.

⁹⁷ Rule 9 Sub rule 1 of The E-Waste (Management) Rules, 2016.

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(2) bulk consumers of electrical and electronic equipment listed in Schedule I shall maintain records of E-waste generated by them in Form-2 and make such records available for scrutiny by the concerned State Pollution Control Board;⁹⁸

(3) consumers or bulk consumers of electrical and electronic equipment listed in Schedule I shall ensure that such end-of-life electrical and electronic equipment are not admixed with E-waste containing radioactive material as covered under the provisions of the Atomic Energy Act, 1962 (33 of 1962) and rules made thereunder;⁹⁹

(4) Bulk consumers of electrical and electronic equipment listed in Schedule I shall file annual returns in Form-3, to the concerned State Pollution Control Board on or before the 30th day of June following the financial year to which that return relates. In case of the bulk consumer with multiple offices in a State, one annual return combining information from all the offices shall be filed to the concerned State Pollution Control Board on or before the 30th day of June of the financial year to which that return relates.¹⁰⁰

f. Dismantler.

(1) Ensure that the facility and dismantling processes are in accordance with the standards or guidelines prescribed by Central Pollution Control Board from time to time;¹⁰¹

(2) Obtain authorisation from the concerned State Pollution Control Board in accordance with the procedure under sub-rule (3) of rule 13;¹⁰²

(3) Ensure that no damage is caused to the environment during storage and transportation of E-waste;¹⁰³

(4) Ensure that the dismantling processes do not have any adverse effect on the health and the environment;¹⁰⁴

⁹⁸ Rule 9 Sub rule 2 of The E-Waste (Management) Rules, 2016.

⁹⁹ Rule 9 Sub rule 3 of The E-Waste (Management) Rules, 2016.

¹⁰⁰ Rule 9 Sub rule 4 of The E-Waste (Management) Rules, 2016.

¹⁰¹ Rule 10 Sub rule 1 of The E-Waste (Management) Rules, 2016.

¹⁰² Rule 10 Sub rule 2 of The E-Waste (Management) Rules, 2016.

¹⁰³ Rule 10 Sub rule 3 of The E-Waste (Management) Rules, 2016.

¹⁰⁴ Rule 10 Sub rule 4 of The E-Waste (Management) Rules, 2016.

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- (5) Ensure that dismantled E-waste are segregated and sent to the authorized recycling facilities for recovery of materials;¹⁰⁵
- (6) Ensure that non-recyclable or non-recoverable components are sent to authorized treatment storage and disposal facilities;¹⁰⁶
- (7) Maintain record of E-waste collected, dismantled and sent to authorised recycler in Form-2 and make such record available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board;¹⁰⁷
- (8) File a return in Form-3, to the concerned State Pollution Control Board as the case may be, on or before 30th day of June following the financial year to which that return relates;¹⁰⁸
- (9) Not process any E-waste for recovery or refining of materials, unless he is authorised with concerned State Pollution Control Board as a recycler for refining and recovery of materials;¹⁰⁹
- (10) Operation without Authorisation by any dismantler, as defined in this rule, shall be considered as causing damage to the environment.¹¹⁰

g. Recycler

- (1) Shall ensure that the facility and recycling processes are in accordance with the standards or guidelines prescribed by the Central Pollution Control Board from time to time;¹¹¹
- (2) Obtain authorisation from concerned State Pollution Control Board in accordance with the procedure under the sub-rule (3) of rule 13;¹¹²
- (3) Ensure that no damage is caused to the environment during storage and transportation of E-waste;¹¹³

¹⁰⁵ Rule 10 Sub rule 5 of The E-Waste (Management) Rules, 2016.

¹⁰⁶ Rule 10 Sub rule 6 of The E-Waste (Management) Rules, 2016.

¹⁰⁷ Rule 10 Sub rule 7 of The E-Waste (Management) Rules, 2016.

¹⁰⁸ Rule 10 Sub rule 8 of The E-Waste (Management) Rules, 2016.

¹⁰⁹ Rule 10 Sub rule 9 of The E-Waste (Management) Rules, 2016.

¹¹⁰ Rule 10 Sub rule 10 of The E-Waste (Management) Rules, 2016.

¹¹¹ Rule 11 Sub rule 1 of The E-Waste (Management) Rules, 2016.

¹¹² Rule 11 Sub rule 2 of The E-Waste (Management) Rules, 2016.

- (4) Ensure that the recycling processes do not have any adverse effect on the health and the environment;¹¹⁴
- (5) .Make available all records to the Central Pollution Control Board or the concerned State Pollution Control Board for inspection;¹¹⁵
- (6). Ensure that the fractions or material not recycled in its facility is sent to the respective authorised recyclers;¹¹⁶
- (7). Ensure that residue generated during recycling process is disposed of in an authorised treatment storage disposal facility;¹¹⁷
- (8) Maintain record of E-waste collected, dismantled, recycled and sent to authorized recycler in Form-2 and make such record available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board;¹¹⁸
- (9) File annual returns in Form-3, to the concerned State Pollution Control Board as the case may be, on or before 30th day of June following the financial year to which that return relates;¹¹⁹
- (10) May accept waste electrical and electronic equipment or components not listed in Schedule I for recycling provided that they do not contain any radioactive material and same shall be indicated while taking the authorisation from concerned State Pollution Control Board;¹²⁰
- (11) Operation without Authorisation by any recycler, as defined in this rule, shall be considered as causing damage to the environment.¹²¹

B. Roles and Responsibilities towards E-Waste Management

Everyone must take responsibility for the management of E-waste

¹¹³ Rule 11 Sub rule 3 of The E-Waste (Management) Rules, 2016.

¹¹⁴ Rule 11 Sub rule 4 of The E-Waste (Management) Rules, 2016.

¹¹⁵ Rule 11 Sub rule 5 of The E-Waste (Management) Rules, 2016.

¹¹⁶ Rule 11 Sub rule 6 of The E-Waste (Management) Rules, 2016.

¹¹⁷ Rule 11 Sub rule 7 of The E-Waste (Management) Rules, 2016.

¹¹⁸ Rule 11 Sub rule 8 of The E-Waste (Management) Rules, 2016.

¹¹⁹ Rule 11 Sub rule 9 of The E-Waste (Management) Rules, 2016.

¹²⁰ Rule 11 Sub rule 10 of The E-Waste (Management) Rules, 2016.

¹²¹ . Rule 11 Sub rule 11 of The E-Waste (Management) Rules, 2016.

a. Government

(1) Department of Industry in State or any other government agency authorised in this regard by the State Government, to ensure marking or allocation of industrial space or shed for E-waste dismantling and recycling in the existing and upcoming industrial park, estate and industrial clusters;¹²²

(2) Department of Labour in the State or any other government agency authorised in this regard by the State Government shall:¹²³

- (a) ensure recognition and registration of workers involved in dismantling and recycling;
- (b) assist formation of groups of such workers to facilitate setting up dismantling facilities;
- (c) undertake industrial skill development activities for the workers involved in dismantling and recycling;
- (d) undertake annual monitoring and to ensure safety & health of workers involved in dismantling and recycling;

(3) State Government to prepare integrated plan for effective implementation of these provisions, and to submit annual report to Ministry of Environment, Forest and Climate Change.¹²⁴

b. Manufacturers, E- Waste recyclers and industries

(2) Generators of wastes should take responsibility to determine the output characteristics of wastes and if hazardous, should provide management options.¹²⁵

(3) All personnel involved in handling e-waste in industries including those at the policy, management, control and operational levels, should be properly qualified and trained.

(4) Companies can adopt their own policies while handling E-wastes.¹²⁶

¹²² Rule 12 Sub rule 1 of The E-Waste (Management) Rules, 2016.

¹²³ Rule 12 Sub rule 2 of The E-Waste (Management) Rules, 2016.

¹²⁴ Rule 12 Sub rule 3 of The E-Waste (Management) Rules, 2016.

¹²⁵ Rule 13 Sub rule 1 of The E-Waste (Management) Rules, 2016.

¹²⁶ Rule 13 Sub rule 2 of The E-Waste (Management) Rules, 2016.

- (5) Companies can and should adopt waste minimization techniques, which will make a significant reduction in the quantity of E-waste generated and thereby lessening the impact on the environment.¹²⁷
- (6) Manufacturers, distributors, and retailers should undertake the responsibility of recycling/disposal of their own products. Manufacturers of computer monitors, television sets and other electronic devices containing hazardous materials must be responsible for educating consumers and the general public regarding the potential threat to public health and the environment posed by their products.¹²⁸

c. Citizens

Waste prevention is perhaps more preferred to any other waste management option including recycling. Donating electronics for reuse extends the lives of valuable products and keeps them out of the waste management system for a longer time. But care should be taken while donating such items i.e. the items should be in working condition, people can afford to use equipment. E-wastes should never be disposed with garbage and other household wastes. This should be segregated at the site and sold or donated to various organizations.

While buying electronic products opt for those that are made with fewer toxic constituents and designed for easy upgrading, offer leasing or take back options and have been certified by regulatory authorities.

d. Procedure for Storage of E-waste.

Every manufacturer, producer, bulk consumer, collection centre, dealer, refurbisher, dismantler and recycler may store the e-waste for a period not exceeding one hundred and eighty days and shall maintain a record of collection, sale, transfer and storage of wastes and make these records available for inspection: Provided that the concerned State Pollution Control Board may extend the said period up to three

¹²⁷ Rule 13 Sub rule 3 of The E-Waste (Management) Rules, 2016.

¹²⁸ Rule 13 Sub rule 4 of The E-Waste (Management) Rules, 2016.

hundred and sixty five days in case the waste needs to be specifically stored for development of a process for its recycling or reuse.¹²⁹

e. Transportation of E-waste.

The transportation of e-waste shall be carried out as per the manifest system whereby the transporter shall be required to carry a document (three copies) prepared by the sender, giving the details as per Form-6: Provided that the transportation of waste generated from manufacturing or recycling destined for final disposal to a treatment, storage and disposal facility shall follow the provisions under Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008.¹³⁰

f. Appeal

(1) Any person aggrieved by an order of suspension or cancellation or refusal of authorisation or its renewal passed by the Central Pollution Control Board or State Pollution Control Board may, within a period of thirty days from the date on which the order is communicated to him, prefer a appeal in Form 7 to the Appellate Authority comprising of the Environment Secretary of the State.¹³¹

(2) The Appellate Authority may entertain the appeal after expiry of the said period of thirty days if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.¹³²

(3) Every appeal filed under this rule shall be disposed of within a period of sixty days from the date of its filing.¹³³

11. The E- Waste (Management) Amendment Rules, 2018.

The E-Waste Management Rules, 2016 have recently been amended by the Centre; vide notification G. S. R. 261 (E), dated 22nd March, 2018 to facilitate and effectively implement the environmentally sound management of E-waste in India.¹³⁴

¹²⁹ Rule 15 of The E-Waste (Management) Rules, 2016.

¹³⁰ Rule 22 Sub rule 1 of The E-Waste (Management) Rules, 2016.

¹³¹ Rule 22 Sub rule 2 of The E-Waste (Management) Rules, 2016.

¹³² Rule 22 Sub rule 3 of The E-Waste (Management) Rules, 2016.

¹³³ Rule 22 Sub rule 4 of The E-Waste (Management) Rules, 2016.

¹³⁴ <http://envfor.nic.in/sites/default/files/e%20waste%20amendment%20notification%202018184020.pdf> f. (Visited on October, 15, 2020).

These amendments have been made with the objective of channelizing the E-waste generated in the country towards authorized dismantlers and recyclers in order to further formalize the E-waste recycling sector.

The amended Rules revise the collection targets under the provision of EPR with effect from 1st October, 2017. By way of revised targets and monitoring under the Central Pollution Control Board (CPCB), effective and improved management of E-waste would be ensured. As per the revised targets of E-waste collection, 10% of the quantity of waste generated shall be collected during 2017-2018. Further, there shall be a 10% increase every year until the year 2023. After 2023, the E-Waste collection target has been fixed at 70% of the quantity of waste generation.¹³⁵

Separate collection targets have been introduced for new producers who have recently begun their sales operations. These would be producers whose sales operations are lesser than the average life of their product.¹³⁶ To undertake the activities prescribed for PROs under these Rules, the PROs shall apply to CPCB for registration. This is a significant and noteworthy amendment as the requirement of PROs to register with CPCB would ensure that CPCB can constantly supervise and keep a check on the activities of PROs.

The CPCB may conduct random sampling of electrical and electronic equipment placed in the market to monitor and verify the compliance of reduction of hazardous substances provisions and the cost of sampling and testing shall be borne by the Government. However, if the product does not comply with the reduction of hazardous substances provisions, then the cost of the reduction of hazardous substances test will be borne by the producer.¹³⁷

4.3. NATIONAL POLICY AND INSTITUTIONAL GUIDELINES

1. National Environmental Policy 2006

The National Environment Policy (NEP), 2006 was to establish a system for collection of recyclable materials. Additionally, the NEP emphasized on

¹³⁵ Rule 2 (g) Schedule III, of the E- Waste (Management) Amendment Rules, 2018.

¹³⁶ Rule 2 (e), The E- Waste (Management) Amendment Rules, 2018.

¹³⁷ Rule 2 (c), The E- Waste (Management) Amendment Rules, 2018.

strengthening the informal sector by providing them with legal recognition, access to institutional finance and relevant technologies so that they could be effectively involved in the mainstream activity of the recycling industry. In view of the inadequacy of some of the legislative and regulatory measures, NEP provided for the formulation of new legislations and regulations to protect and safeguard the environmental health along with human health.¹³⁸

The fundamental objectives of the National Environment Policy are listed below. These objectives outline the contemporaneous perception of the environmental challenges of the time.

1. **Conservation of Critical Environmental Resources:** It involves protecting and conserving crucial ecological systems and resources along with vital natural and human-made heritage. These are essential for livelihoods, economic growth, and the well being of man.
2. **Intra-generational Equity:** It includes securing equitable access of environmental resources to different sections of society with a specific focus on low-income groups which are mostly reliant on environmental resources for livelihoods.
3. **Inter-generational Equity:** It aims at wise and judicious use of environmental resources to meet the demands and needs of the current generation without compromising with the aspirations and needs of the future generations.
4. **Integration of Economic and Social development Environmental concerns:** It focuses on integrating environmental concerns into effective plans, programs, projects, and policies for socio-economic progress.
5. **Efficient use of Environmental Resource:** It involves ensuring efficient use of environmental resources to reduce their use per unit of economic output, in order to reduce negative ecological impacts.
6. **Environmental Governance:** It means applying the fundamental principles of good governance to manage and regulate the use of environmental resources.
7. **7.Enhancement of Resources for Environmental Conservation:** It aims at partnering with various local communities, public agencies, investors,

¹³⁸ Suresh P Singh, "India 2006 National Environment Policy" 05 *CUTS India* (2016).

researchers, and academic groups to ensure higher resource flows, including finance, technology, management skills, traditional knowledge for environmental protection.

2. Guidelines for Environmentally Sound Management of E-waste, 2008

Considering the growing concern on the issue of E-waste, the Government of India has supported several initiatives, particularly the assessment conducted by the CPCB on the management and handling of E-waste which led to the preparation and the publication of the Guidelines for Environmentally Sound Management of E-waste in March 2008. The Guidelines have been formulated with the objective of providing broad guidance for identification of various sources of E-waste and the approach and methodology for handling and disposal of E-waste in an environmentally sound manner. These Guidelines include details such as E-waste composition and recycle potential of items of economic value, identification of possible hazardous contents in E-waste, the recycle, re-use and recovery options, treatment and disposal options and the environmentally sound E-waste treatment technologies.

The Guidelines also emphasize the concept of Extended Producer Responsibility (EPR), a concept on which the Western countries base their disposal practices. The EPR is an environment protection strategy that makes the producer responsible for the entire life cycle of the product, especially for take back, recycle and final disposal of the product. Thus, the producers' responsibility is extended to the post-consumer stage of the product life cycle. The Guidelines state that inclusion of the EPR in the legislative framework would make it a mandatory activity associated with the production of electronic and electrical equipments over a period of time. Such a move would also oblige the producer to set up collection centers for E-waste either individually or jointly.

The CPCB has insisted on putting the onus of enforcement on the State Pollution Control Boards (SPCBs). The State Department of Environment or the SPCB may prescribe more stringent norms as deemed necessary. Apart from publishing the Guidelines on various aspects of the hazardous waste management, the Ministry of Environment and Forests has also provided financial assistance for strengthening the SPCBs for facilitating implementation of the Rules. Financial

assistance has also been provided for setting up Common Treatment, Storage and Disposal Facilities for hazardous wastes management. In addition, the Ministry and the CPCB from time to time sponsor training programmes for creation of awareness about the provisions laid down in the Rules.

3. Guidelines on Implementation of E-Waste (Management) Rules, 2016

The E-Waste (Management) Rules, 2016 mandate central pollution control board to prepare guidelines on implementation of E-Waste Rules, these guidelines include extended producer responsibility, channelization, collection centres, storage, transportation, environmentally sound dismantling and recycling, refurbishment, and random sampling of EEE for testing of RoHS parameters¹³⁹.

This Guidelines Extended Producer Responsibility is the responsibility of every producer of electrical and electronic equipment for channelization of E-waste to an authorised recycler to ensure environmentally sound management of such waste. EPR authorisation is mandatory and has to be obtained by all the producers including importers, E-retailers, sellers etc. of EEE covered in E-Waste (Management) Rules, 2016. A producer can implement its EPR either through take-back system or by setting up collection centres or both for channelisation of E-waste products to authorised dismantlers, recyclers. The producers are required to have arrangements with authorised dismantlers, recyclers either individually or collectively or through a Producer Responsibility Organisation or E-Waste Exchange system as spelt in their EPR Plan which is authorised by Central Pollution Control Board. Selling or placing of EEE in the market by any producer without EPR Authorisation shall be considered as violation of the Rules and causing damage to the environment, which shall attract provisions under Environment Protection Act, 1986¹⁴⁰.

4.4. CONCLUSION

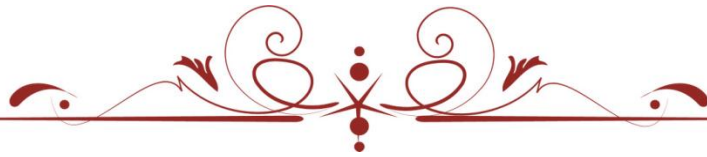
After the analysis of the existing laws and policies in India it can be safely concluded that E-waste problem still growing because of the non-implementation of E-waste regulations by enforcement agencies. For effective implementation of the E-Waste Rules, the producers have to take responsibility for their products. A

¹³⁹ Rule 1, Para 5 of the Guidelines on Implementation of E-Waste (Management) Rules, 2016.

¹⁴⁰ Rule 2, Para 1 of the Guidelines on Implementation of E-Waste (Management) Rules, 2016.

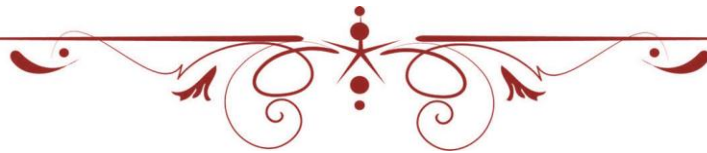
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synchronized endeavour by the industries and the pollution control boards and local authorities is crucial to cope up with the problem of E-waste in India. The relaxation in the EPR Plan by reduction in the E-waste collection targets and overture of realistic collection targets will result in increased observance of the E-Waste Rules by organizations. Also, the requirement of PROs to register with Central Pollution Control Board would aid in the creation of an organized and legitimate industry and would pave way for effective and improved E-waste management in India.



CHAPTER-V

E-WASTE: IMPACT ON HUMAN HEALTH AND ENVIRONMENT



CHAPTER-V

E-WASTE: IMPACT ON HUMAN HEALTH AND ENVIRONMENT

5.1. INTRODUCTION

Waste of electrical and electronic equipment generated in huge amount surround the earth today, and has become a global environmental issue. Electronic waste is a common, informal name for electronic products approaching the end of their useful life. The current and the future production of E-waste, the potential environmental problems associated with their disposal and management practices are discussed whereas the existing E-waste management. E-wastes are considered dangerous, as certain components of some electronic products contain materials that are harmful, depending on their condition and density. The harmful content of these materials pose a threat to human health and environment.¹ Its toxic emissions mixed with virgin soil and air and causing harmful effects to the entire biota either directly or indirectly. Direct impacts include release of acids, toxic compounds including heavy metals, carcinogenic chemicals and indirect effects such as bio magnification of heavy metals. Discarded computers, televisions, DVD, stereos, copiers, fax machines, electric lamps, cell phones, audio equipment and batteries if improperly disposed can leach lead and other substances into soil and groundwater².

Electronic waste affects nearly every system in the human body because the materials that make up e-waste contain a plethora of toxic components, including mercury, lead, cadmium, polybrominated flame retardants, barium, and lithium. Even the plastic casings of electronic products contain polyvinyl chloride. The health effects of these toxins on humans include birth defects and damage to the brain, heart, liver, kidney and skeletal system.³ They will also significantly affect the human

¹ Mahipal Singh Sankhla and Mayuri kumara, "Effect of Electronic waste on Environmental & Human health- A Review" 01 *IOSR* 10 (2016).

² Rakesh Johri, *E-waste: Implications, Regulations and Management in India and Current Global Best Practices*, 50 (The Energy and Resources Institute, 2008).

³ Eric Williams, Ramzy Kahhat and Braden Allenby, "Environmental, Social and Economic implications of Global Reuse and Recycling of Personal Computers" 42 *IJEST* 46-54 (2008).

body's nervous and reproductive systems. All these chemicals are persistent bioaccumulative toxins (PBTs) that create environmental and health risks when computers are incinerated, buried in landfills, or melted down. When computer monitors and other electronics are burned, they release cancer-producing dioxins into the air that we all breathe⁴. If electronics are thrown in landfills, these toxins may leach into groundwater, affecting local aquifers and entering the food chain. Although these problems are more prevalent right now in the developing countries that accept our shipments of e-waste for processing, toxic waste knows no borders. The more electronics waste we generate, the greater the environmental and health dangers for everyone⁵.

In this chapter, the researcher has analyzed the impact of e-waste on human health and the environment.

5. 2. E- WASTE AND ITS IMPACT ON HUMAN HEALTH

The E-waste is a diverse combination of various types of toxic elements, which have an impact on the environment and human health. E-waste is highly complex to handle because of its composition. It is made up of multiple components some of which contain toxic substances that have an adverse impact on human health⁶.

The potential human health risks from exposure to E-waste are particularly higher for women and children. Pregnant women and children are the most vulnerable groups but every individual can be affected by the pollutants. This includes not only the workers but all of the residents in the surrounding environment that are being exposed to the spreading environmental contamination.⁷

Children are typically directly involved in informal E-waste recycling according to the International Labour Organization and if they are not, they can experience second hand exposure from toxic E-waste residues that are introduced into their homes from clothing and other materials and objects. This is known as take-

⁴ Santhanam Needhidasan, "Electronic waste an emerging threat to the environment of urban India" 03 *JESHE* 12(2014).

⁵ Jirang Cui, Hans Jorgen Roven "Electronic Waste: A Handbook for Management" 281(1st ed, Elsevier, 2011).

⁶ Jayapradha Annamalai, "Occupational health hazards related to informal recycling of E-waste in India: An overview" 2 *IJOEM* 19(1) (2015).

⁷ V. N. Pinto, "E-waste Hazard: The Impending Challenge" 5 *IJOEM* 65 (2013).

home exposure which can lead to long-term low-level exposure, especially considering the hand-to-mouth behaviour typical in younger children that can lead to ingestion of toxic substances. These children are considered as valuable workers because they have smaller nimble hands that give them an advantage in dismantling E-waste.⁸

Therefore, it is important to address the environmental contamination resulting from informal E-waste recycling and disposal methods because the hazardous chemicals can accumulate within the body. This can potentially cause negative health effects primarily because of the chemicals lipophilicity which is the ability of the chemical to dissolve in the lipids and oils in humans⁹.

5.3. E-WASTE CATEGORIES AND RELEASABLE ENVIRONMENTAL TOXICANTS

Electrical and electronic devices are manufactured using a complex blend of components, which often contain several hundred different substances both toxic and non-toxic in nature. E-wastes includes large household appliances (*e.g.* TV, refrigerators, air-conditioning systems, washing machines, etc.), small household appliances, IT and telecommunication devices, lighting equipment, leisure and sports equipment, medical devices, monitor and control instruments, automatic dispensers, hand-held digital apparatuses and so forth. Some of these have a life-cycle of only a few years or even less. E-waste, in most of the cases, contains many hazardous substances extremely dangerous to human health and the environment, and therefore, their disposal requires special treatment to prevent leakage and dissipation of toxics into the environment¹⁰. In addition, the immune-suppressive effects of many chemicals may add to the increased susceptibility of person in developing countries to infectious diseases the point here is that chemical exposures derived from unsafe e-waste recycling practices may add to existing public health disease burdens in developing countries where resources are already stretched. Given below is a table

⁸ Grant "Health consequences of exposure to e-waste: a systematic review" 6 *TLGH* 50 (2013).

⁹ Rajasekhar Bala subramanian and Obulisamy Parthiba Karthikeyan,(ed.),"*E-Waste Recycling Environmental and Health Impacts*" 358 (Taylor & Francis Inc. 2016)

¹⁰Monika and Jugal Kishore, "E-Waste Management: As a Challenge to Public Health in India" 3 *IJCM* 35(3) (2010).

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showing the major pollutants occurring in waste electrical and electronic equipments:

Pollutants and their occurrence in waste electrical and electronic equipment.¹¹

Pollutant	Occurrence
Arsenic	Semiconductors, diodes, microwaves, LEDs (Light-emitting diodes), solar Cell
Barium	Electron tubes, filler for plastic and rubber, lubricant additives
Brominated flame - proofing agent	Casing, circuit boards (plastic), cables and PVC cables
Cadmium	Batteries, pigments, solder, alloys, Circuit boards, computer batteries, monitor cathode ray tubes (CRTs)
Chrome	Dyes/pigments, switches, solar
Cobalt	Insulators
Copper	Conducted in cables, copper ribbons, coils, circuitry, pigments.
Lead	Lead rechargeable batteries, solar, transistors, lithium batteries, PVC (polyvinyl chloride) stabilizers, lasers, LEDs, thermoelectric elements, circuit boards
Liquid crystal Displays	Displays
Lithium	Mobile telephones, photographic equipment, video equipment (batteries)
Mercury	Components in copper machines and steam irons; batteries in clocks and pocket calculators, switches, LCDs
Nickel	Alloys, batteries, relays, semiconductors, pigments
Silver	Capacitors, switches (contacts), batteries, resistors
Zinc	Steel, brass, alloys, disposable and rechargeable batteries, luminous substances

Listed in the table below are the harmful elements in the compositions of electrical and electronic appliances that can be hazardous to health and environment.¹²

¹¹ Rakesh Johri, (ed.), *E-waste: Implications, regulations and management in India and current global best practices*, 93 (TERI, New Delhi, 2008).

¹² Needhi sdsan, Santhanam et al. "Electronic waste: an emerging threat to the environment of urban India" 36 *JEHSE*12 (2014).

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Metal	Danger
Lead	A neurotoxin that affects the kidneys and the reproductive system. High quantities can be fatal. It affects mental development in children. Mechanical breaking of CRTs (cathode ray tubes) and removing solder from microchips release lead as powder and fumes.
Plastics	Found in circuit boards, cabinets and cables, they contain carcinogens. BFRs or brominated flame retardants give out carcinogenic brominated dioxins and furans. Dioxins can harm reproductive and immune systems. Burning PVC, a component of plastics, also produces dioxins. BFR can leach into landfills. Even the dust on computer cabinets contains BFR
Chromium	Used to protect metal housings and plates in a computer from corrosion. Inhaling hexavalent chromium or chromium 6 can damage liver and kidneys and cause bronchial maladies including asthmatic bronchitis and lung cancer.
Mercury	Affects the central nervous system, kidneys and immune system. It impairs foetus growth and harms infants through mother's milk. It is released while breaking and burning of circuit boards and switches. Mercury in water bodies can form methylated mercury through microbial activity. Methylated mercury is toxic and can enter the human food chain through aquatic.
Beryllium	Found in switch boards and printed circuit boards. It is carcinogenic and causes lung diseases.
Cadmium	A carcinogen. Long-term exposure causes Itai-itai disease, which causes severe pain in the joints and spine. It affects the kidneys and softens bones. Cadmium is released into the environment as powder while crushing and milling of plastics, CRTs and circuit boards. Cadmium may be released with dust, entering surface water and groundwater.
Acid	Sulphuric and hydrochloric acids are used to separate metals from circuit boards. Fumes contain chlorine and sulphur dioxide, which cause respiratory problems. They are corrosive to the eye and skin.

1. Lead

The negative effects of lead are well established and recognized. It was first banned from gasoline in the 1970s. Lead causes damage to the central and peripheral nervous systems, blood systems, kidney and reproductive system in humans. Effects on the endocrine system have been observed and its serious negative effects on children's brain development are well documented. Lead accumulates in the environment and has high acute and chronic effects on plants, animals and micro-organisms. The main applications of lead in computers are: glass panels and gasket (frit) in computer monitors (3-8 pounds per monitor), and solder in printed circuit boards and other components.¹³

2. Aluminium

A small percentage of people are allergic to aluminium and experience contact dermatitis, digestive disorders, vomiting or other symptoms upon contact or ingestion of products containing aluminium, such as deodorants or antacids. Although the use of aluminium cookware has not been shown to lead to aluminium toxicity in general, excessive consumption of antacids containing aluminium compounds and excessive use of aluminium-containing antiperspirants provide more significant exposure levels. Studies have shown that consumption of acidic foods or liquids with aluminium significantly increases aluminium absorption, and maltol has been shown to increase the accumulation of aluminium in nervous and osseous tissue. Furthermore, aluminium increases estrogen-related gene expression in human breast cancer cells cultured in the laboratory.¹⁴

3. Cadmium

Cadmium components may have serious impacts on the kidneys. Cadmium is adsorbed through respiration but is also taken up with food. Due to the long half-life in the body, cadmium can easily be accumulated in an amount that causes symptoms of poisoning. Cadmium shows a danger of cumulative effects in the environment due to its acute and chronic toxicity. Acute exposure to cadmium fumes

¹³BH. Robinson, "E-waste: an assessment of global production and environmental impacts" 183 *STE* 408 (2009).

¹⁴Cui J, Forssberg "Mechanical recycling of waste electric and electronic equipment: A review, *Journal of Hazardous Materials*" 243 *JHM* 99 (2003).

causes flu-like symptoms of weakness, fever, headache, chills, sweating and muscular pain. The primary health risks of long term exposure are lung cancer and kidney damage. Cadmium also is believed to cause pulmonary emphysema and bone disease¹⁵.

4. Mercury

Mercury can cause damage to various organs including the brain and kidneys, as well as the fetus. Most importantly, the developing fetus is highly susceptible through maternal exposure to mercury. When inorganic mercury spreads out in the water, it is transformed to methylated mercury in the bottom sediments. Methylated mercury easily accumulates in living organisms and concentrates through the food chain, particularly via fish, it is estimated that 22 % of the yearly world consumption of mercury is used in electrical and electronic equipment, (t is used in thermostats, sensors, relays, switches (e.g. on printed circuit boards and in measuring equipment), medical equipment, lamps, mobile phones and in batteries. Mercury, used in flat panel displays, will likely increase as their use replaces cathode ray tubes¹⁶

5. Hexavalent Chromium/Chromium VI

Chromium VF is still used as corrosion protection of untreated and galvanized steel plates and as a decorative or hardener for steel housings. It easily passes through cell membranes and is then absorbed producing various toxic effects in contaminated cells. Chromium VI can cause damage to DNA and is extremely toxic in the environment.¹⁷

6. Plastics Including PVC

Plastics make up 13.8 pounds of an average computer. The largest volume of plastics (26%) used in electronics has been poly-vinyl-chloride (PVC). PVC is mainly found in cabling and computer housings, although many computer moldings are now made with the somewhat more benign ABS plastics. PVC is used for its fire-retardant

¹⁵ Management of E-Waste: Guidelines For Environmentally Sound 2010, Available at: http://www.cpcb.nic.in/upload/Latest/Latest_71_Implementation_ofE-WasteRules.pdf, (visited on Jan.10, 2018).

¹⁶ Avinash Kumar Agarwal, "Measurement Analysis and Remediation of Environmental Pollutants" 58 (Energy, Environment, and Sustainability Singapore, 2020).

¹⁷ R. Cayumil, R. Khanna, et.al. (eds.), "Environmental Impact of Processing Electronic Waste -S Key Issues and Challenges"13 (Intech Publicaiopn, 2016).

properties. As with many other chlorine-containing compounds, dioxin can be formed when PVC is burned within a certain temperature range.¹⁸

7. Brominated flame retardants (BFRs)

BFRs are used in the plastic housings of electronic equipment and in circuit boards to prevent flammability. More than 70% of BFR usage in the electronics industry consists of tetra-bromo-bis-phenol 120% is polybrominated diphenyl ethers and less than 1% is polybrominated biphenyls (PBB). Some BFRs have been targeted for phase out by the European Parliament between the years of 2016 and 2020.¹⁹

8. Barium

Barium is a soft silvery-white metal that is used in computers in the front panel of a CRT, to protect users from radiation. Studies have shown that short-term exposure to barium has caused brain swelling, muscle weakness, damage to the heart, liver, and spleen²⁰. There is still a lack of data on the effects of chronic barium exposures to humans. Animal studies, however, reveal increased blood pressure and changes in the heart from ingesting barium over a long period of time.²¹

9. Beryllium

Beryllium is a steel-grey metal that is extremely lightweight, hard, a good conductor of electricity and heat, and is non-magnetic²². These properties make beryllium suitable for many industrial uses, including, electronic applications such as computers. In computers, beryllium is commonly found on mother-boards and “finger clips” as a copper beryllium alloy used to strengthen the tensile strength of connectors and tiny plugs while maintaining electrical conductivity. Beryllium has recently been classified as a human carcinogen as exposure to it can cause lung cancer. The primary health concern is inhalation of beryllium dust, fume or mist. Workers who are constantly exposed to beryllium, even in small amounts, and who become sensitized to it can develop what is known as Chronic Beryllium Disease (berylliosis), a disease

¹⁸ Daniel Mmereki, Baizhan Li, , et.al. (eds.), *The Generation, Composition, Collection, Treatment and Disposal System, and Impact of E-Waste* 70 (Intech Publicaiopn 2016).

¹⁹ *Ibid.*

²⁰ Vishaklia, “E- Waste: Managing the Digital Dump Yard”, 14 *ICFAI University Press*, (2007).

²¹ Jirang Cui and Hans J. Roven, (eds.), *Waste: A Handbook for Management*, 281-296 (Elsevier Inc, 2011).

²² R.E.Hester. R.M. Harrison, *Electronic Waste Manaement* 89 (RSC Publishing, June, 2008).

which primarily affects the lungs. Exposure to beryllium also causes a form of skin disease that is characterized by poor wound healing and wart-like bumps²³.

10. Arsenic (As)

Arsenic is a poisonous metallic element which is present in dust and soluble substances. Chronic exposure to arsenic can lead to various diseases of the skin and decrease nerve conduction velocity. Chronic exposure to arsenic can also cause lung cancer and can often be fatal²⁴.

11. Chlorofluorocarbons (CFCs)

Chlorofluorocarbons are compounds composed of carbon, fluorine, chlorine, and sometimes hydrogen. Used mainly in cooling units and insulation foam, they have been phased out because when released into the atmosphere, they accumulate in the stratosphere and have a deleterious effect on the ozone layer. This results in increased incidence of skin cancer in humans and in genetic damage in many organisms²⁵.

12. Antimony (Sb)

Antimony is a metal with a variety of industrial uses, including as a flame retardant (as antimony trioxide) and as a trace component of metal solders. In some forms, antimony shows many chemical similarities to arsenic, including in its toxicity. Exposure to high levels in the workplace, as dusts or fumes, can lead to severe skin problems and other health effects. Antimony trioxide is recognized as a possible human carcinogen²⁶.

13. Phosphor and additives

Phosphor is an inorganic chemical compound that is applied as a coat on the interior of the CRT faceplate. Phosphor affects the display resolution and luminance of the images that is seen in the monitor. The hazards of phosphor in CRTs are not well known or reported, but the U.S. Navy has not minced words about the hazards involved in some of their guidelines: "NEVER touch a CRT's phosphor coating, it is

²³SatishSinha, PritiMahesh,Waste Electrical And Electronic Equipment The EU And India: sharing best practices, 28 Toxic links, available at: www.toxiclink.org (Visited on July 29, 2019).

²⁴Available at: http://www.unep.or.jp/ietc/Publications/spc/EWasteManual_Vol1.pdf (visited on Feb. 25, 2018).

²⁵*Supra note 17.*

²⁶*Ibid.*

extremely toxic. If you break a CRT, clean up the glass fragments very carefully. If you touch the phosphor seek medical attention immediately.” The phosphor coating contains heavy metals, such as cadmium, and other rare earth metals, e.g. zinc, vanadium, etc. as additives. These metals and their compounds are very toxic. This is a serious hazard posed for those who dismantle CRTs by hand. It was in an effort to counter the unsustainable and unjust effects of free trade in toxic wastes, that an international treaty known as the Basel Convention was created in 1989. And it was also for this reason that the Basel Convention in 1994 agreed to adopt a total ban on the export of all hazardous wastes from rich to poor countries for any reason, including recycling.²⁷

14. Nonylphenol (NP)

Nonylphenol is a chemical most widely known as a breakdown product of nonylphenol ethoxylate (NPE) detergents, though it has reportedly also been used as an antioxidant in some plastics. It is a strong endocrine disruptor, capable of causing intersex (individuals with both male and female characteristics) in fish. Nonylphenol can also build up through the food chain and may be capable of causing damage to DNA and even sperm function in humans²⁸.

15. Polybrominated diphenyl ethers (PBDEs)

PBDEs is one of several classes of brominated flame retardants used to prevent the spread of fire in a wide variety of materials, including casings and components of many electronic goods. They are environmentally persistent chemicals, some of which are highly bio-accumulative and capable of interfering with normal brain development in animals. Several PBDEs are suspected endocrine disruptors, demonstrating an ability to interfere with hormones involved in growth and sexual development. Effects on the immune system have also been reported.²⁹

16. Triphenyl phosphate (TPP)

TPP is one of several organo phosphorus flame retardants used in electronic equipment, for example in the casings of computer monitors. TPP is acutely toxic to

²⁷Research Unit, E-waste in India. (Rajyasabha Secretariat, New Delhi,2011).

²⁸.*Supra* note 17

²⁹.*Ibid.at .p.06*

aquatic life and a strong inhibitor of a key enzyme system in human blood. It is also known to cause contact dermatitis in some individuals and is a possible endocrine disruptor³⁰.

17. PCBs (polychlorinated biphenyls)

PCB is widely used in insulating fluids for electrical transformers and capacitors, as well as flame-retardant plasticisers in PVC and other polymer applications. They are highly persistent and bio accumulative chemicals rapidly becoming widespread through the environment and building up several thousand-fold in body tissues of wildlife. PCBs exhibit a wide range of toxic effects including suppression of the immune system, liver damage, cancer promotion, damage to the nervous system, behavioral changes and damage to both male and female reproductive systems³¹.

18. Selenium(Se)

Exposure to high concentrations of selenium compounds cause selenosis. The major signs of selenosis are hair loss, nail brittleness, and neurological abnormalities³².

19. Toner Sweeping

Certain areas of India are dedicated to printer dismantling. In those areas the Operations strictly deal with toner cartridges, both black as well as the cyan, magenta and yellow toners of colour copiers and printers. We observed that the only recycling taking place involved the small amounts of residual toner, with the black cartridge plastic largely discarded. Workers without any protective respiratory equipment or special clothing of any kind opened cartridges with screw drivers and then used paint brushes and their bare hands to wipe the toner into a bucket. The final end-use of the recovered toner is uncertain. The process created constant clouds of toner that billowed around the workers and was routinely inhaled. In the course of the workday, the worker's skin and clothing was blackened. Material Safety Data Sheets (MSDS) provided by Xerox and Canon indicate that although carbon black and other black toner ingredients are not toxic, they will cause lung and respiratory irritation. Other

³⁰ .Available at: <http://archive.basel.int/convention/basics.html>, (last visited on Feb.25, 2018)

³¹ .supra note 17

³² .Ibid.at .p.12

documentation claims that carbon black is a possible human carcinogen.³³ No reference indicating what chemicals are present in colour toners has been found.

5.4. IMPACTS OF E-WASTE ON THE ENVIRONMENT AND NATURAL RESOURCES

The environmental contamination as a result of improper e-waste recycling and illegal disposal activities can lead to both direct and in-direct exposures via soil, air, dust, and water around e-waste recycling sites, after wards affecting the biota zone.³⁴

1. EFFECTS ON AIR QUALITY

One of the most common effects 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.³⁵

2. 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, intake of the contaminated water by humans and land animals results in lead poisoning. Some of these heavy metals are also carcinogenic.³⁶

³³ Deepali Sinha Khetriwal, "Global Perspectives on E-waste" 25 *EISR* 436, (2005).

³⁴ Yakub Ansari, Aqueel Ahmad "Effect of Electronic Waste on Environmental and it's Management" 4970 *IIRSET* 7 (2018).

³⁵ Andrew Morton, "Wasted: The Effects of E-Waste on the Environment" 21 *Clean Light Recycling* 4(2019).

³⁶ *Ibid.*

3. EFFECTS ON SOIL

In this way, 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, brain, heart, liver, kidney and skeletal system damage.³⁷

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 resources³⁸.

In the Earth's crust, aluminium is the most abundant (8.3% by weight) metallic element and the third most abundant of all elements (after oxygen and silicon). Because of its strong affinity to oxygen, however, it is almost never found in the elemental state; instead it is found in oxides or silicates. Feldspars, the most common group of minerals in the Earth's crust, are alumina silicates. Native aluminium metal can be found as a minor phase in low oxygen fugacity environments, such as the interiors of certain volcanoes. It also occurs in the minerals beryl, cryolite, garnet, spinel and turquoise. Aluminium is 100% recyclable without any loss of its natural qualities³⁹.

Recovery of the metal via recycling has become an important facet of the aluminium industry. Recycling involves melting the scrap, a process that requires only 5% of the energy used to produce aluminium from ore. However, a significant part (up to 15% of the input material) is lost as dross (ash-like oxide). The dross can undergo a further process to extract aluminium. Recycling was a low-profile activity until the late 1990s, when the growing use of aluminium beverage cans brought it to the public awareness. If drives are repairable or usable they are sold in the market; if not, they are broken into pieces with circuits and other parts separated accordingly

³⁷Satish Sinha (ed.), *Impact of E-Waste Recycling on Water and Soil* 04 (Toxics Link, 2014).

³⁸Available At : http://www.greencitizen.com/harmful_effects.php (Visited 12 January 2021).

³⁹Lide, D. R., (ed.) *Magnetic susceptibility of the elements and inorganic compounds* 51 *CRC Press* 86 (2005).

Circuit Boards, including Motherboards, Cards, Chips and Processors The methods by which these metals are extracted are very harmful to the workforce due to the fumes emitted during their burning and melting .circuit boards are first heated by blow-torch and then the valuable chips are removed for further sale or precious metal extraction.⁴⁰

5.5. E-WASTE AND SOCIETY

Hazardous waste is any discarded solid or liquid material that is toxic, ignitable, corrosive, or reactive enough to explode or release toxic flames. According to the UN Environment Programme, developed countries produce 80-90% of these wastes. The US centers for Disease control and prevention (CDC) estimates that at least 400000US children still have unsafe blood levels of lead caused by exposure from the number of sources. National academy of science and numerous other studies indicate there is no safe level of lead in children's blood. Lead is especially harmful to children and is still used in leaded gasoline and household paint in about 100 countries Although it is hardly well known, E-waste contains a witches' brew of toxic substances such as lead and cadmium in circuit boards; lead oxide and cadmium in monitor cathode ray tubes (CRTs); mercury in switches and flat screen monitors; cadmium in computer batteries; polychlorinated biphenyls (PCBs) in older capacitors and transformers; and brominated flame retardants on printed circuit boards, plastic casings, cables and polyvinyl chloride (PVC) cable insulation that release highly toxic dioxins and furans when burned to retrieve copper from the wires.⁴¹

There are a range of hazardous and toxic compounds that may be present in significant quantities or can be formed during the processing of E-waste. All these different types of contaminants are associated with severe environmental and health consequences. Some pollutants can be dispersed through the air, water and soil. In other cases, by-products are dumped directly into the soil or waterways, where the subsequent leaching of pollutants could contaminate the environment and influence food chain supplies as well. Direct human exposure to these contaminants can also have irreversible health effects. There is evidence of dermal, gastrointestinal, hepatic, neurologic toxicity and breath issues in humans, immunologic toxicity and

⁴⁰*Supra note*, 36 page no. 05

⁴¹P. Maltezou, "Hazardous Waste Management", 197 UNDL (1987).

reproductive issues in animals, high levels of lead, copper and chromium, especially in children, changes in milk, placenta, hair and thyroid hormone levels, and even lung cancer and leukaemia cases.⁴²

The identification of various hazardous substances present in a range of E-waste, toxic compounds generated during processing, as well as the public awareness regarding the severe consequences to health and environment caused by improper handling and processing of E-waste is crucially important. This know how will lay the foundations of sustainable processing of E-waste, and prevent the release of toxic pollutants during the recovery of valuable resources.

Better practices in collection, handling and processing of E-waste are needed, especially in the developing countries where E-waste is mostly processed informally and inappropriately, with huge consequences on environment and health. While stricter regulations have improved and reduced the toxic emissions to the environment, however, there has been an accumulation of hazardous compounds over time. There is an urgent need to improve current approaches towards developing environmentally friendly waste recycling and material recovery⁴³.

5.6. CONCLUSION

After analyzing the above discussion, electronic waste if not disposed-off properly may become a serious challenge for the human health and environment in the coming future. From the Government side the enforcement of the laws needs to be stricter than ever with an intention to reduce this problem as soon as early before it becomes a threatening hazard for the world. This emphasize the immediate efforts on the part of Governments ,corporate ,consumers, environmentalists to manage the Electronic waste through implementing a proactive and protective protocol for the agencies working in E-waste reuse, recycle and disposal properly.

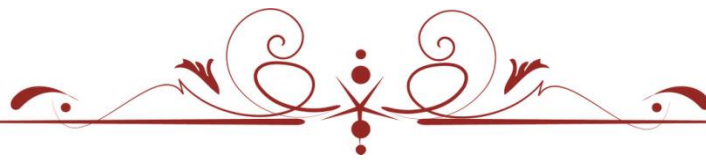
The most common practices adopted for disposal of E-waste are acid baths, land filling and open air burning. When electronic equipments are burned, they release abundant fumes which are dangerous for environment way beyond our

⁴² Available at: http://wiego.org/informal_economy_law/waste-pickers-india# (Visited on July 29, 2003).

⁴³ Bhaskar, K., & Turaga, "India's e-waste rules and their impact on e-waste management practices: A case study" 930 *Journal of Industrial Ecology* 4 (2018).

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imagination and estimation. Reduce the generation of E-waste through smart procurement and good maintenance. Reuse still functioning electronic equipment by donating or selling it to someone who can still use it. There is indeed a dire need for proper rules, regulation for its management.



CHAPTER-VI

ROLE OF JUDICIARY AND POLLUTION CONTROL BOARDS FOR E-WASTE MANAGEMENT



CHAPTER-VI

E-WASTE MANAGEMENT: ROLE OF JUDICIARY AND POLLUTION CONTROL BOARDS

6.1. Introduction

In contemporary era electronic waste has become a huge problem for the world as we continue to grow the technology and become their slaves. If an instant action is not taken right away, it will continue to grow and will become a much bigger problem for the planet. Also, it has a massive bearing on environment and human life if not handled in an environmentally sound manner. There has to be sufficient rights for citizens to take legal recourse for damages caused to their health, environment and property.¹ Therefore, it has become the necessity of the time to manage the electronic waste in an organized and safe manner with sustainable recycling technologies. There is a need for stringent penal provisions and robust monitoring mechanisms to deal and match up with electronic waste of present times. It is imperative to have strict penalties like other countries analyzed here have because according to deterrence theory, people are most likely to be dispirited from committing a crime if the punishment is instantaneous, evident and severe. Also, there is a need to adopt effective strategy to encourage re-use, refurbishing or recycling of E-waste in specialized facilities to prevent environmental contamination and human health risks.²

In this chapter, the researcher has analysed the role of judiciary, national green tribunal and pollution control boards for the proper electronic waste management.

6.2. ENVIRONMENTAL PROTECTION: JUDICIAL APPROACH

The problem of environmental pollution has been recognized as a worldwide disaster. Development without regard to the ecological equilibrium has led to an

¹ Rakesh Johri, *E-waste: Implications, regulations and management in India and current global best practices* 3 (TERI, New Delhi, 2008).

² Florin Constantin Mihai, *E-Waste in Transition: From Pollution to Resource* 25 (In Tech Open, 2016),

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environmental crisis during 19th and 20th century. Urbanization, modernization and the race for technological and industrial development has caused the ecological imbalance. So there must be some check on this exploitation of earth in the name of urbanization.

Judiciary always plays a very important role in the growth and development of constitutional law. Besides the function of interpretation and application of the law, it can perform the educative functions of bringing an awareness of the major problems of pollution, through various decisions from time to time.³ Public consciousness about environmental protection and preservation has contributed immensely in furtherance of administration of environmental justice in India.

For the proper management of waste and protection of the environment from pollution, the Supreme Court of India and also various High Courts have taken innumerable measures in a series of their landmark judgments. Over the years, the Apex Court has been paying special attention, for the protection of environment by giving effective directions to all the persons concerned with the matter by invoking in powers under the Article 32 of Indian Constitution. An analysis of the various decisions of the Supreme Court reveals that the Apex Court exercised its writ jurisdiction when there exist some leading cases which hamper the degradation of the environment⁴. Judicial response to almost all environmental litigations has been very positive in India.⁵ Public Interest Litigation has become very popular in the field of environment. Contrary to the past practices, the position today is that a person acting bonafide and having a sufficient interest can move the courts for redressing public injury, enforcing public duty, protecting social and collective rights and vindicating public interests. Courts have widened the dimensions of substantive rights to health and a clean and unpolluted environment.⁶ Thus, in order to reap the benefits of substantive environmental rights courts opened a path of precision justice, without enslaving themselves to procedural compulsions. In *Tarun Bharat Sangh Alwar v.*

³ V G Shinde , “Judicial contribution in enhancing environmental jurisprudence” *IJL*, 20 Vol 4; Issue 1; (2018) Available at: www.lawjournals.org. (Visited on April,12, 2019).

⁴ H.N. Tiwari, *Environmental Law*, 80 (Allahabad Law Agency , Fourth Edition 2011).

⁵ Geetanjoy Sahu,, *Environmental Jurisprudence and the Supreme Court* 64 (Orient Black Swan Pvt. Ltd. New Delhi,2014).

⁶ P. Leelakrishnan, *Environmental Law in India*, 180 (Butterworth’s Indian, New Delhi, 1999).

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*Union of India*⁷ a social group challenged the legality of granting a mining license in the protected area of a reserved forest, upholding the contention, the Supreme Court observed:

“This litigation should not be treated as the adversial litigation. Petitioners are acting in aid of the purpose high on national agenda. Petitioners concern for the environment, ecology and wildlife should be shared by the government”

This observation of the Court is significant as it emphasizes the rationale of public interest litigation in environmental issues. The State is directed by the Directive Principles to protect the environment. Any person who raises an environment issue, whether individual, group or institution is equally concerned with the problem and such litigation can never be concerned as one of the adversial confrontation with the State.⁸ The evolution of environmental action as a right in public law has been facilitated by a number of provisions in the Constitution of India which gave scope of Judicial Review and Writ remedies to High Courts and the Supreme Court.

Citizens have direct access to the Supreme Court to ventilate environmental grievances as they are now deemed to be fundamental rights violations. The Indian Courts have not only recognized a substantive fundamental right to environmental protection but also read an important procedural right of cleanliness and reasonableness as part of the right to life and liberty. This “Due Process” provision, in turn, has led to the creation of a variety of other rights which makes the judiciary an activist agent in environmental protection and management.⁹ Thus, the courts have not only ordered municipalities to enforce public nuisance law against polluters, they have also ordered that local governments find the budgetary resources to build water supply and sanitation systems in reasonable time.¹⁰

⁷ AIR 1992 SC 514

⁸ Shyam Divan and Armin Rosencranz, *Environmental Law and Policy in India: Cases Material and Statutes*, 315 (Oxford University Press, New Delhi, 2002).

⁹ P.S. Jaswal, *Environment Law*, 79 (Allahabad Law Agency, 2006).

¹⁰ *Supra note*. 8.

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One big series of potential pollution of river water is the discharge of sewage into them by the municipalities. The municipal statutes, therefore, contain provisions that sewage is not to be discharged into rivers unless it is so treated as not to affect prejudicially the purity and quality of the water into which it is discharged. If such a restriction can be imposed on the public authorities, there is no reason why factories and private persons should not also be similarly restricted.¹¹ Whenever the municipal authorities are guilty of lapses in the compliance with these statutory provisions, everyone who is affected by pollution of the water would have a cause of action against the municipality. Since municipalities are public authorities relief against them can be had by way of writ petition filed under Article 226 of the Constitution. A mandamus can be issued to a municipality compelling it to do its duty in this respect.¹²

6.3. NEW TRENDS IN INDIAN JUDICIARY

The judiciary has played a very vital role in protecting the environment and checking its degradation and pollution. It is the judiciary, which introduced the concept of environmental jurisprudence and made continuous serious efforts to make the people aware about the dire consequences of environmental pollution¹³. Keeping in view the dangerous consequences of environmental pollution, the judiciary has propounded the theories of “Absolute Liability”¹⁴ theory of “Polluter Pays”¹⁵ and theory of “Public Trust.”¹⁶ Further, the judiciary has not only made tremendous efforts to protect the flora and fauna but also interpreted the right to life in such a way as to include the right to pollution free and wholesome environment. In this regard judiciary has jumped from one principle to another, that is, from strict liability¹⁷ to absolute liability and, from compensatory principle¹⁸ to polluter pays principle and to the principle of public trust. *In M/s Chhatisgarh H.L Industries v. Special Area*

¹¹ S.C. Shastri, *Environment Law*, 102 (Eastern Book Company, Lucknow, 2018).

¹² *Supra note*. 10

¹³ Shailendra Kumar Gupta, “Principles of International Environmental Law and Judicial Response in India” 37 *BLJ* 143 (2008).

¹⁴ *M.C. Mehta v. Union of India*, A.I.R. 1987 SC 1086

¹⁵ *Indian Council for Enviro-Legal Action v. Union of India* A.I.R. 1996 SC 1446

¹⁶ *M.C. Mehta v. Kamal Nath*, (1997) 1SCC 388

¹⁷ *Ryland v. Fletcher*, 1868, L.R. 3 HL 331

¹⁸ AIR 1996 SC 2715.

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*Development Authority, Bilaspur and Others*¹⁹ the Madhya Pradesh High Court pointed out that protection of environment from pollution is a matter of public interest and when there is a clash between personal interest and public interest, the latter must prevail.

In *M.C. Mehta v. Union of India*²⁰ a public interest petition was filed in the court for preventing nuisance caused by the pollution of the river Ganga. The Court observed that

“The nuisance caused by the pollution of the river Ganga was a public nuisance, which was widespread in range and indiscriminate in its effect. The court in this case issued specific directions to the Kanpur Municipal Corporation for the controlling pollution of the river Ganga”.

In *UP Pollution Control Board v. M/s Modi Distiller and others*²¹ In this case the industrial unit of the Company at Modinagar, Ghaziabad was engaged in the business of manufacture and sale of industrial alcohol. The said unit discharged its highly noxious and polluted trade effluents into the Kali River through the Kadrabad Drain and thereby caused continuous pollution of the stream without the consent of the UP Water Pollution Board. It was mandatory for the industry to obtain the consent of the Board. The court held responsible everyone in charge and responsible for the conduct of the business of the company, as well as the company deemed to be guilty of the offence.

In *Bhopal Gas Tragedy Case*,²² the Supreme Court has played a vital role. It showed its deepest concern for the life and liberty of the people which has affected by the leakage of the poisonous gas resulting into the pollution of the environment, affecting adversely the health of millions, the death of many and incapacitating their life forever. The Court directed the Government to immediately provide interim relief for the victims of the gas tragedy, which has been directed to be released in the month

¹⁹A.I.R. 1989 MP 82.

²⁰A.I.R. 1988 SC 1115.

²¹A.I.R. 1988 SC 1128.

²²M.C. Mehta v. Union of India, AIR 1987 SC 1086

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of May, 1993 under the directions of the Government of India to the Reserve Bank of India.

In *Union Carbide Corporation v. Union of India*²³ the Supreme Court directed that

“the Union Carbide Corporation to pay a sum of US Dollar 470 million to the Union of India in full settlement of all claims and liabilities related to and arising out of the Bhopal Gas Leakages Disaster. The Supreme Court considered it a compelling duty, both judicial and humane, to secure immediate relief to the victims. The court held that right to live in a healthy environment cannot be violated by anyone under the plea that if any harm is caused then the injured party shall be suitably compensated. The right to live in a healthy environment is supreme”.

The Supreme Court also emphasized that there is also a need to evolve a national policy to protect national interest from ultra hazardous pursuits of economic giants. Jurists, technologists and other experts in economics, sociology and public health etc., should identify areas of common concern and help in evolving proper criteria, which may receive judicial recognition and legal sanction. The court further pointed out that there are certain things, which a civilized society simply cannot permit to be done to its members even if they are compensated for their resulting losses.²⁴

In *Tarun Bharat Singh, Alwar v. Union of India*,²⁵ the matter involved relates to the environmental pollution caused by mining operations in Sariska Tiger Park in Alwar District in the State of Rajasthan.

“The court directed that if admittedly or indisputably, mines are situated within protected area, then the mining activities must be stopped. However, if upon a demarcation of the boundary line any mining area is shown to fall clearly outside the protected area, then the bank will not operate.”

²³ AIR 1990 SC 273

²⁴ *Ibid.*

²⁵ (1993) SCC Supl. (3) 115

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In *People United for Better Living in Calcutta-Public and Another v. State of West Bengal and other*²⁶, the court held that

“The development shall have to be in closest possible harmony with the environment, as otherwise, there would be development but no environment, which would result in total devastation. Times has now come to check and control the degradation of the environment and since the Law Courts also have a duty towards the society for its proper growth and further development and more so by reason of definite legislations in regard thereto, it is a plain exercise of the judicial power to see that there is no such degradation of the society and there ought not to be any hesitation thereto”.

In *M/s Mahabir Soap and Gudakhu Factory v. Union of India*²⁷ the petitioner was carrying on tobacco processing operations in its units, which was generating highly polluted effluents and the effluents were discharged from its unit without any treatment, thereby resulting in pollution of the water. This unit was being operated without the consent of the State Pollution Control Board in violation of Water (Prevention and Control of Water Pollution) Act, 1974. The power to stop the continuance of industrial unit is in the discretion of the State Board and it is not for the court to go into propriety of reason and substitute its opinion in place of the decision of the State Board.

In *Ishwar Singh v. State of Haryana*,²⁸ the Punjab and Haryana High Court awarded compensation to the victims of pollution hazards, as violation of Article 21 of Indian Constitution, caused due to stone-crushers activities in violation of the directions of Supreme Court.

In *Union of India v. Kamath Holiday Resort Pvt. Ltd.*²⁹, the Supreme Court held that

²⁶ A.I.R. 1993 Cal. 215

²⁷ A.I.R.1995 Orissa218.

²⁸ A.I.R.1996 P & H30.

²⁹ A.I.R. 1996 SC 1040.

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“Under Section 2 of the Forest (Conservation) Act, 1980, whenever any forestland was to be dereserved for establishing a holiday resort by a private company, permission of the Central Government is imperative. The Court further observed that all current streams of thought lead towards protection of environment and preservation of forest wealth”.

The decision in *M.C. Mehta v. Union of India*³⁰ is one of the most leading decisions of the Supreme Court regarding environmental protection. This case is popularly called as Taj Trapezium case. In this case, the Supreme Court directed that 292 listed coke/coal using industries located in Agra be re-located or closed to prevent degradation to Taj-Mahal. The closure by December 31, 1997 is unconditional and irrespective of the fact whether the new unit outside TTZ (Taj Trapezium Zone) is completely set up or not.

6.4. ROLE OF JUDICIARY AND NATIONAL GREEN TRIBUNAL FOR E-WASTE MANAGEMENT

In order to address the problem of solid waste and E-waste management law has seen considerable development in the last two decades. The development of the laws in this area has seen a considerable share of initiative by the Indian judiciary, particularly the higher judiciary, consisting of the Supreme Court of India, and the High Courts of the States. India’s activist judiciary has undertaken the task of proper management of E-waste and its efforts to protect the environment have become effective to a certain extent only through PIL. E-waste has many adverse effects on ecology. The judiciary has encouraged the environmentalist to take up important ecological issues through PIL. It has entertained petitions under article 32 and 226 of the constitution of India under its writ jurisdiction by way of broadening the rigid doctrine of locus standi. It has acted in an inquisitorial manner to enforce fundamental rights. Thus the credit may go to judiciary and national Green Tribunal for taking measures in E waste management³¹.

³⁰A.I.R. 1997 Sc 734.

³¹ Jayati Ghosh, “*Digital Dumps*” Frontline, March 14, (2008).

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In its efforts to protect the environment from hazardous E waste, the Indian Judiciary particularly the Supreme Court in general have relied on the public trust doctrine, precautionary principle, polluter pays principle the doctrine of strict and absolute liability, the exemplary damages principle, the pollution fine principle and inter-generational equity principle apart from the existing law of the land. Another guiding principle has been that of adopting a model of sustainable development. The consistent position adopted by the courts as enunciated in its judgments has been that there can neither be development at the cost of the environment or environment at the cost of development.³²

The fundamental rights part of the constitution of India does not have any specific mention of the environmental matters. Here the Supreme Court played a pivotal role. The Supreme Court, in its interpretation of Article 21, has facilitated the emergence of the environmental jurisprudence in India³³. The Supreme Court and the high courts have in several cases held that maintenance of health and preservation of sanitation falls within the purview of Article 21 of the Constitution as it adversely affects impacts health and life of citizens, in the event of default. It has therefore mandated municipal authorities to remove rubbish, filth, night soil or any noxious or offensive matter and to ensure their proper and scientific disposal. Apart from the municipal authorities, the National Green Tribunal, the Pollution Boards also have a basic duty under the Environment (Protection) Act, 1986 to assist in the proper disposal of the waste³⁴.

In *Municipal Council Ratlam v. Vardhichand*³⁵, for the first time, the Supreme Court treated an environmental problem differently from an ordinary complaint or public nuisance. The Supreme Court speaking through Justice V.R. Krishna Iyer and lamented that:

“A responsible municipal council constitute for the precise purpose of preserving public health and providing better facilities

³² Constantin Mihai, *E-Waste in Transition: From Pollution to Resource*, (In Tech Publication, New Delhi 2016).

³³ Shailendra Kumar Gupta, “Principles of International Environmental Law and Judicial Response in India” 37&38 *Ban. L.J.* 140, (2008-09).

³⁴ Sumeet Malik, *Environmental Law*, 175 (Eastern Book Company, Lucknow 1st Edition 2008)

³⁵ AIR 1980 SC 1622

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cannot run away from its principal duty by pleading financial inability. Decency and dignity are non-negotiable facets of human rights and are a first charge on local self-government bodies. The court praised an activist judiciary that forces communities to provide sanitation and drainage services so that the poor can live in dignity³⁶.”

In *Virendar Gaur v. State of Haryana*,³⁷ the Supreme Court has declared that

“Right to life under Article 21 encompasses right to live with human dignity, quality of life, and decent environment. Thus, pollution free environment and proper sanitary condition in cities and towns is considered to be integral part of right to life”.³⁸

In *Subhash Kumar v. State of Bihar*³⁹, the Court observed that

“The right to live is a fundamental right under Article 21 of the Constitution, and it includes the right of enjoyment of pollution-free water and air for full enjoyment of life. If anything endangers or impairs that quality of life in derogation of laws, a citizen has the right to have recourse to Article 32 of the Constitution”⁴⁰.

In *B. L. Wadherav. Union of India*,⁴¹ The Court observed that:

“Historic city of Delhi, the Capital of India is one of the most polluted cities in the world. The authorities responsible for pollution control and environment protection have not been able to provide clean and healthy environment to the resident of Delhi. Apart from air and water pollution, the City is virtually an open dustbin. Garbage strewn all over Delhi is a common sight.”

³⁶*Id.* at 1629.

³⁷1995(2) SCC. 577.

³⁸*Id.*,at 580

³⁹A.I.R 1991 SC 420

⁴⁰*Id.*,at 424.

⁴¹A.I.R 1996 SC 2969

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The Court also issued directions to the Delhi Municipal Corporation and other authorities to perform their statutory duties.

In *K.K. v. State of Punjab and Others*⁴² The National Green Tribunal directed that:

“To remove the garbage dumping ground situated in between the residential area and adjacent to Government School. To say that the E waste material is being dumped in the open area, reference was made to the photographs placed on record”.

In *Satpal Singh & others v. Municipal Council Gardhiwala and others*,⁴³ the National Green Tribunal held that:

“The Respondents have failed to implement *Municipal Solid Wastes (Management and Handling) Rules, 2000* and discharge their duties under the Punjab Municipal Act, 1911. The Respondents have failed to ensure that Fundamental Right available to the citizens of the township in the matter of protection of life is taken care of. The right to life includes the right to pollution free air and pure water. Having regard to the foregoing discussion, we deem it proper to allow the application and give appropriate directions to the Respondents. The Tribunal directed to take immediate action to shift the dumping ground “HadaRori” to a suitable place outside the limits of Municipal Council and if necessary by acquiring a suitable land, after negotiating with owner of such land and to complete the shifting process within a period of six months hereinafter.”

Again in *Toxic link v. Union of India & Others*⁴⁴, the National Green Tribunal held that:

“All stakeholders, particularly, the local authorities upon whom burden lies to ensure proper collection, segregation, transportation and disposal of solid waste should act in complete coordination and

⁴² CWP No. 19627 of 2012 <http://indiankanoon.org/doc/34267076> visited on 13/03/2020

⁴³ [www.greentribunal.in/judgement/15-2013_\(THC\)\(App\)_25april2013,_final_order_pdf](http://www.greentribunal.in/judgement/15-2013_(THC)(App)_25april2013,_final_order_pdf). (Visited on March, 13, 2020)

⁴⁴ Case no. 183/2014(CZ), National Green Tribunal,) Final judgement, 06 Apr. 2014.

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coherence to ensure that the country tackles this menace of E-waste management, objectively, effectively and ensures that there is no pollution of the environment and consequent adverse impacts on public health.”

In *Mr. Asim Sarodev. Maharashtra Pollution Control Board*⁴⁵ The National Green Tribunal held that:

“Unauthorized and unscientific burning of wire which emits smoke containing toxic gases and pollutants affecting the environment and human health”

In *Nagrik Upbhokta and Ors. v. State of M.P.*⁴⁶ In this case the brief fact was that the Petitioner has raised the issue of ill effects of Electrical and Electronic waste in three states such as Madhya Pradesh, Rajasthan and Chhattisgarh were involved. It was the contention of the Applicant that after the notification of the *E-waste (Management & Handling) Rules, 2011* under the Environment Protection Act, 1986 by the Ministry of Environment and Forests, Government of India no concrete steps have been taken by the authorities concerned to implement the Rules of 2011 leading to environmental degradation.⁴⁷ After going through the whole case the National Green Tribunal has given certain directions to:

“To comply with the requirement of the rule 4 in respect of the items listed in Schedule I of the Rules of 2011 related to collection of E-waste, enforcing and implementation of EPR.”⁴⁸

The bench also directed that:

“The guidelines issued by the CPCB, for the implementation of E-waste Rules 2011 providing for the role of State Pollution Control Boards shall be adhered to.”⁴⁹

⁴⁵ Application No. 43/ 2013, National Green Tribunal,) Final judgement, 06 Sep. 2014.

⁴⁶ Case no. 143/2013(CZ), National Green Tribunal,) Final judgement, 15 Jan. 2015 .

⁴⁷ *Ibid.*, para 3.

⁴⁸ *Id.*, para 18 i.

⁴⁹ *Id.*, para 18 ii.

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The Tribunal also directed that:

“Effective implementation of the EPR shall rest entirely with the Producer and for the aforesaid purpose and its sound management the Producer shall be made responsible.”⁵⁰

The Tribunal further directed that:

“The State Pollution Control Boards shall issue notice to all stakeholders i.e. Producer, Bulk Consumer, Dismantler, Recycler for getting themselves registered as required under the Rules of 2011 and for submitting necessary information by way of complying with the requirement under the Rules for getting the registration done. The application for registration shall be submitted by the Producer, Dismantler and Recycler within 45 days of the receipt of notice from State Pollution Control Board.⁵¹ The Notice shall be issued by the State Pollution Control Boards of all the 3 states within 2 weeks of the receipt of this judgment. Failure to comply with aforesaid direction for submitting the application shall entail the consequence as provided under the Rules.”⁵²

In *Sourendra Nath Dutt v. Sony India (Kolkata Branch)*⁵³

“The external damage caused to the electronic goods by rat cannot be an issue which the manufacturer is responsible for. In fact, change or replacement of the goods on expiry of warranty is also an unreasonable claim. The Respondent proposal for replacement of the same at a discounted rate, put forward under letter dated 08/02/2016 does not seem to be unreasonable one in the above perspective which the Appellant/Complainant did not accept.”

⁵⁰ *Id.*, para 18 vi.

⁵¹ *Id.*, para 18 vii.

⁵² *Id.*, para 18 viii.

⁵³ Complaint Case No. CC/70/2016 of District Kolkata-II(Central) Final judgement, 05 Jun 2018.

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In *Almtra H. Patel v. Union of India*⁵⁴

“The National Green Tribunal that the direct all the municipal corporation, Delhi municipal council and Delhi cantonment board to place before us their action plan regarding collection, segregation, and handling of waste and its management timelines corresponding to each of the stages there in. As regard Hazardous E-waste it needs to be noticed that presently, there is no disposal facility therefore in existence within NCT Delhi.”

6.5. ROLE OF POLLUTION CONTROL BOARDS FOR E-WASTE MANAGEMENT

India’s federal system divides responsibility for different Governmental functions between the centre and the states. Since the natural resource management has traditionally been a State subject, many aspects of environmental policy, including forestry and water pollution, are considered to be state matters. Nevertheless, but now the impetus for Governmental regulation of environment pollution has come from the centre. In 1976, for example the Constitution was amended to include statutes that both the Government and citizens have the duty to protect and improve the environment.⁵⁵

The statutory attempts in India to control pollution can be traced to the legislation of the local bodies. Local bodies exercised all such powers as were necessary for the suitable disposal of waste. They exercised regulatory control to prevent and abate nuisance from water sources, which adversely affects the agriculture.⁵⁶ Contaminated water supply, noxious vegetation, harmful dust and smoke or unsanitary conditions of buildings were of much concern to the local bodies, and sanctions were imposed against persons who violated the regulations.⁵⁷ The role of the Ministry of Urban Development, Government of India is largely limited to advising the urban local bodies, supporting research and development and providing technical assistance to the states and urban local bodies. The institute in formulating National Pollution Control standards began about in 1984, when the Central

⁵⁴ Application No. 428 of 2017, National Green Tribunal,) Final judgement, 03 Feb. 2018.

⁵⁵ Vinay Vaish “Environment Laws In India” 2 VAA New Delhi (2017).

⁵⁶ P. Leelakrishnan, *Environmental Law in India*, 159 (Lexis Nexis, New Delhi 4th edn., 2016).

⁵⁷ Bernard Galea “Waste Regulation in India: An Overview” 08 *CPPRKerla* (2010)

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Department of the Environment began to promulgate Minimum National Standards (MINAS). MINAS have been promulgated both for the water (ten industries) and for air (12 industries). The industries to be subjected to MINAS appear to have been selected because they were highly polluting or so large in volume that pollution is a problem, because they were located in or near population centers.⁵⁸

The Central Pollution Control Board (formerly Central Board for Prevention and Control of Water Pollution) together with the State Pollution Control Boards completed a country wide rapid inventory of Pollution from large and medium industries. This was in execution of the “Control of Pollution at Source” programme.⁵⁹ Minimal National Standards (MINAS) for polluting discharge from specific industries were formulated and control measures implemented in stringent manner. With the coming into effect of the Air Pollution Act, 1981, programmes, after the framing of the notifications and Rules under the Act were completed during the eighties which included strengthening of administrative support systems, inventory areas for declared air pollution control zones, evolution of ambient air quality standards as well as industry specific emission standards. The Central Pollution Boards and the State Boards are now made responsible for assessment, survey, monitoring and enforcement of standards of air and noise pollution.⁶⁰

Pollution Control Boards, Central Pollution Control Board and State Pollution Control Boards are principle statutory organs entrusted with the responsibility to implement the environmental statutory provisions. The purpose of these Boards is to implement the principles of sustainable development forms the basis of environmental policies and economic policies.⁶¹ The State Pollution Control Boards and Central Pollution Control Boards are constituted to control the air pollution, water pollution and industrial pollution. Section 3 and 4 of the Water (Prevention and Control of Pollution) Act, 1974 establishes the Central and State Boards for the prevention and control of water pollution. Section 3 and Section 4, of Air (Prevention and Control of

⁵⁸ Sadhan Kumar Ghosh “State of the 3Rs in Asia and the Pacific” 35-50 *UNCRD* (2017).

⁵⁹ A. Kumar and, B.B. Hosetti, *Environmental Impact Assessment and Management*, 168 (Astral International, 2014).

⁶⁰ Kailash Thakur, *Environmental Protection Law and Policy in India*, 133 (Deep & Deep Publications New Delhi, 2013).

⁶¹ A.K. Tiwari, *Environmental Laws in India*, 59 (Deep and Deep Publishers, New Delhi, 3th edn., 2006).

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Pollution) Act, 1981, clarifies that the Central and State Pollution Control Boards established under the Water (Prevention and Control of Pollution) Act, 1974, shall be deemed to be constituted under the Air (Prevention and Control of Pollution) Act, 1981. The provisions of the Air (Prevention and Control of Pollution) Act, 1981, Relating to powers and functions of Central and State Pollution Control Boards are similar to the powers and functions under the Water (Prevention and Control of Pollution) Act, 1974.⁶²

1. THE FORMATION OF POLLUTION CONTROL BOARDS

The Central Pollution Control Board as well as the State Pollution Control Boards is the principal statutory organs entrusted with the responsibility of water and air pollution control. The enactment of the Environment (Protection) Act, 1986 which is an umbrella legislation for enforcement of measures for protection of environment, the Amendment introduced in the Air (Prevention and Control of Pollution) Act, 1981, and the Water (Prevention and Control of Pollution) Act in 1987 and 1988 respectively and the enactment of the Public Liability Insurance Act, 1991 have furthered widened the ambit of the Board's functions.⁶³

The Central Pollution Control Board has established an operational mechanism for carrying out its functions. Key working areas have been identified for speedy implementation of pollution control programmes. The first step in the direction is that the pollution assessment. This task is being done through survey and monitoring. Survey includes (a) inventorisation of pollution sources, and (b) assessment of pollution of river basins and sub-basins. The monitoring aspect includes, (a) monitoring of air, inland waters and coastal waters at national level, (b) monitoring of effluents and emissions from large and medium industries, and (c) data interpretation and quality assurance of data.⁶⁴

Pollution control is being done through planning and implementation of control programmes. Planning deals with the co-ordination of the activities of the

⁶² P.S. Jaswal And Nishtha Jaswal, *Environmental Law*, 201 (Allahabad Law Agency, Faridabad, 5th edn., 2010).

⁶³ Sukanta K. Nanda, *Environmental Law*, 108 (Central Law Publications, Allahabad, 3 rd Edn., 2013).

⁶⁴ Kailash Thakur, *Environmental Protection Law and Policy in India*, 133 (Deep & Deep Publications New Delhi, 2013).

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various State board, ministries and government department. Implementation which is the main thrust includes: (a) setting / updating of standards, and (b) implementation of standards at the national and state levels through the state pollution control boards, and (c) enforcement through legal actions for achieving the various objectives the Boards functions through scientific support system including laboratories services.⁶⁵

The State Boards are required to specifically lay down effluent standards for Government undertakings, municipalities, and other local bodies which comply with these predetermined standards. The Water (Prevention and Control of Pollution) Act, 1974 provides for a permit system or consent order to prevent the pollution of water. The Water (Prevention and Control of Pollution) Act 1974 generally prohibits disposal of polluting matter in streams, wells and sewers or on land in excess of standards established by the State Boards. The State Boards are authorized to give its consent after making inquiry in the prescribed manner. The preamble of the Water Act refers to restoring the wholesomeness of the water resources.⁶⁶

Water bodies and streams are useful for several purposes they are habitat for many aquatic organisms, Prohibition of disposal of polluting matter to a stream or well or sewer or on land, is the key to the regulation under the Water (Prevention and Control of Pollution) Act 1947. According to this system, no person shall knowingly cause or permit poisonous, noxious, or polluting matter to enter into a stream or well or sewer or on land. The prohibition extends to a case, where the entry of any other matter impedes the proper flow of water in a manner leading, or likely to lead, to a substantial aggravation of pollution.⁶⁷ Although, violation of these provisions is against the public interest and leads to penal consequences, this offence stands different from public welfare offences in a modern Welfare State, as the knowledge about the harm and mensrea are the most important elements to constitute an offence under the Water (Prevention and Control of Pollution) Act, 1947. No person without obtaining the consent of the State Pollution Control Board established under the Water (Prevention and Control of Pollution) Act, 1947, can establish or take any steps

⁶⁵*Ibid*

⁶⁶Sairam Bhat, *Natural Resources Conservation Law*, 20 (SAGE Publication, New Delhi, 1stEdn., 2010).

⁶⁷Shibani Ghosh (Ed.), *Indian Environmental Law: Key Concepts and Principles*, 200 (Orient Black Swan, Hyderabad ,2019).

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to establish any industry, which is likely to discharge sewage or trade effluents.⁶² An application for consent has to be made by the person who intends to establish any industry or carry out an operation or process or treatment or disposal system.⁶⁸ The consent can be given with or without conditions. Violation of conditions may lead to withdrawal of consent and to prosecution.⁶⁹

Thus the Pollution Control Boards are set up by the special enactments with the duty to prosecute environmental offenders have been able to achieve very little by way of their prosecution. Procedural delays, lack of expertise in the structure of the boards and too much institutional commitments to the executive are some of the reasons for this failure. Also, unlike the Executive Magistrate, who is available in every district, the Board is usually located in State Capitals, which is too far from the site of commission of the offence.⁷⁰ The amendment to the Water (Prevention and Control of Pollution Act) 1974 and Air (Prevention and Control of Pollution) Act 1981, in the eighties conferred on every person the locus standi to approach the Courts to prosecute environmental offenders after a sixty day notice period. When, however, a provision in an existing law has failed to address a prevailing situation, courts have tried to fill in the lacunae. *Ratlam*⁷¹ and *Krishan Gopal*⁷² settled, among other things, the problems of effluents and air pollution under section 133 of the Code of Criminal Procedure despite the existence of special laws dealing with those questions.⁷³

2. CENTRAL BOARDS AND STATE POLLUTION CONTROL BOARDS

For implementation of pollution laws, Central Pollution Control Board and the State Pollution Control Boards are constituted. It became mandatory on the part of all industries installed after the Water (Prevention and Control of Pollution) Act 1974 is passed to take clearance from the Pollution Control Boards. The Water (Prevention and Control of Pollution) Act, 1974, provides stringent measures against those who violate the provision of the Act. It provides for a sentence which may run from six

⁶⁸ Water (Prevention and Control of Pollution) Act 1974, Section 24.

⁶⁹ Water (Prevention and Control of Pollution) Act 1974, Section 25.

⁷⁰ Water (Prevention and Control of Pollution) Act 1974, Section 26.

⁷¹ AIR 1980 SC 1622.

⁷² (1986) Cr Lj 396.

⁷³ P. Leelakrishnan, *Environmental Law in India*, 31 (Lexis Nexis, New Delhi 4th edn., 2016).

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months to six years. Similarly, the Air (Prevention and Control of Pollution) Act 1981 provides for imposition of fine and also imprisonment for a term depending on the gravity of the situation.⁷⁴

3. CENTRAL POLLUTION CONTROL BOARD (CPCB)

The Central Pollution Control Board, a statutory organization was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981. It serves as a field formation and also provides technical services to the Ministry of Environment and Forests under the provisions of the Environment (Protection) Act, 1986. Principal functions of the CPCB, as spelt out in the Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act 1981, are to promote the quality of air and control and abate the pollution in the country. The other function is to control and abate the water pollution through the cleanliness of wells and streams.

The Parliament of India in its wisdom enacted the Water (Prevention and Control of Pollution) Act, 1974 with a view to maintaining and restoring wholesomeness of our water bodies. One of the mandates of Central Pollution Control Board is to collect, consolidate and disseminate technical and statistical data relating to water pollution.⁷⁵

4. CONSTITUTION OF CENTRAL BOARD

The Environment (Protection) Act, 1986, deals with the constitution of the Central Board by the Central Government, to be called the Central Pollution Control Board to exercise the powers conferred on and performs the functions assigned to the Board under the Act⁷⁶. As provided under the Environment (Protection) Act, 1986, 1974, the Central Board shall consist of the following members, namely, a Chairman who is having experience and knowledge and experience in matters relating to environmental protection or having the experience in the institutions for

⁷⁴ P.S.Jaswal And Nishtha Jaswal, *Environmental Law*, 201 (Allahabad Law Agency, Faridabad, 3rd edn., 2016).

⁷⁵ S.C.Shastrri, *Environmental Law*, 252 (Eastern book company, Lucknow, 6th Edn., 2012)

⁷⁶ Section 3 of The Environment (Protection) Act, 1986.

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administrating institutions related to preventing the environment pollution. Five other members who are to be nominated by the Central Government to represent the matters related with Central Government. Five members are to be nominated by the Central Government from the members representing the local authorities within the state. Central Government may elect two persons to represent the companies owned by the Central Government. To represent the interest of the agriculture, fishery or industry or trade, five members are to be nominated by the Central Government.⁷⁷ A person having the qualifications in the field of management, scientific and engineering may be selected as full time member-secretary.

The Board so constituted shall be a body corporate-meaning a “legal person”, having perpetual succession. Therefore, it can also acquire, hold and dispose of and enter into a contract. As Such Central Pollution Control Board can also sue and be sued in this name.

5. FUNCTIONS OF THE CENTRAL BOARDS AT THE NATIONAL LEVEL

The main functions of the Central Board are to promote cleanliness of in different areas of the State. The central board advice the Central Government on any matter concerning improvement of the matters related with air quality and also give advise with the prevention and control of water and air pollution. It may Plan and execute a nationwide programme for the prevention, control or abatement of water and air pollution.⁷⁸

Sometimes disputes may arise among the two State Pollution Control Boards it may work out to solve the disputes among two State Boards. It may encourage the research related activities being performed by the State Pollution Control Boards in the preventing, controlling and abating the pollution. To prevent the air and water pollution it may organize the training sessions and mass awareness programmes for the persons engaged in the prevention of pollution programmes. Statistical data and technical data of the matters related to water and air pollution are published by the Central Pollution Control Board as a measure devised for the effective knowledge about the prevention and control and abatement of the pollution. It may also compile

⁷⁷ SukantaK.Nanda, *Environmental Law*, 108 (Central Law Publications, Allahabad, Third Edn., 2013)

⁷⁸ M.G. Chitkara, *Encyclopaedia of Ecology, Environment and Pollution*, Vol. 14, 38 (1997).

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the data so collected earlier to see whether the pollution of the source has increased or decreased. It also disseminates information in respect to matters relating to water and air pollution and their prevention and control. In Consultation with the State Government it may modify or annul the standards for streams or wells. The Central Pollution Control Board may also such other functions as may be prescribed to it by the Government of India.⁷⁹

6. POWERS OF THE CENTRAL POLLUTION CONTROL BOARD

The Central Pollution Control Boards are empowered by Section 18 of the Water Act to give directions to the State Pollution Control Boards relating to the matters with water and air pollution. In case of non compliance of the functions by the State Pollution Control Boards the Central Pollution Control can perform that function that is directed to the State Pollution Control Board. The Central Pollution Control is also empowered to issue directions for the stopping of the supply of electricity, water or any other service to any defaulting industry. It can also issue directions for the closure, prohibition or regulation of any defaulting industry engaged in the water or air pollution.⁸⁰

6.6. STATE POLLUTION CONTROL BOARD

The State Boards are required to specifically lay down effluent standards for government undertakings, municipalities, and other local bodies which comply with these predetermined standards. Pollution Control Board has the power under the Environment (Protection) Act, 1986 and Rules to lay down standards for emissions or discharge of environmental pollutants. Rule 3 (2) of the Act, even permits the boards to specify more stringent standards from those provided under the Rules.⁸¹

The Act provides for a permit system or consent order to prevent the pollution of water. The Act generally prohibits disposal of polluting matter in streams, wells and sewers or on land in excess of standards established by the State Boards. The State Boards are authorized to give its consent after making inquiry in the prescribed manner. The functions of State Boards specified by the Water (Prevention and

⁷⁹ Benny Joseph, *Environmental Studies*, 250 (McGraw Hill, India, 3rd Edn., 2017).

⁸⁰ Section 18 of the Water (Prevention and Control of Pollution) Act, 1974.

⁸¹ Environment (Protection) Act, 1986

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Control of Pollution) Act, 1974, not only include the planning a comprehensive programme for prevention, control and abatement of water pollution and encouraging, conducting and participating in investigation and research of water pollution problems in the State. But also include inspection of the facilities for sewage and trade effluent treatment as well as developing economical and reliable methods of treatment of sewage and trade effluents.⁸²

1. CONSTITUTION OF THE STATE POLLUTION CONTROL BOARD

Section 4 of the Act empowers the State Government to constitute a State Pollution Control Board (SPCB) in their respective States. Such Boards shall consist of the members, who shall be nominated by the State Governments; a one person is elected as Chairman who is having knowledge or practical experience in the matters related with environmental protection or Person having knowledge in administering institutions dealing with the matters related with environmental protection.⁸³ Five persons are selected who shall represent the Government in the State. Five members are appointed among the members representing the local authorities functioning within the state. A person having the knowledge, possessing the qualifications or experience of scientific engineering in the field of controlling pollution shall be appointed as the full time member-secretary of the State Pollution Control Board. Three persons are appointed having the interest of agriculture, fishery or industry or trade which must in the opinion of the State Government ought to be represented. Two persons are elected who may represent the companies or corporations managed by the State Government.⁸⁴

It has also been provided that every SPCB so constituted shall be a legal person and a body corporate having perpetual succession who can acquire, hold, and dispose of property and also enter into a contract.⁸⁵

⁸² Vinay N. Paranjape, *Environmental Law*, 126 (Central Law Agency, Allahabad, First Edn., 2013)

⁸³ S. Shantha kumar, *Introduction To Environmental Law*, 125. (Wadhwa And Company, Nagpur, Second Edn., 2005)

⁸⁴ *Ibid*

⁸⁵ Supra note,70

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2. FUNCTIONS OF THE STATE POLLUTION CONTROL BOARD

The Water (Prevention and Control of Pollution) Act, 1974, has mentioned many functions of the State Pollution Control Board, the main functions that are performed by the Pollution Control are to control and abate the pollution caused by the water and to advise the State Government on the matters relating to the water pollution and to secure the execution of the orders related with the comprehensive programmes for the prevention of control of pollution in the State.⁸⁶ The Board may organize and train the persons engaged in the prevention and control of pollution of water.

It can also organise mass awareness programmes in the general public relating to the matters of pollution in collaboration with the Central Pollution Control Boards. For the inspection of the purification of the water that is being disposed in the sewage by the industries through the sewage treatment plant, it can inspect the sewage or trade effluents being discharged by the industries and in case of any discrepancy orders the consent as required by the act. It may participate, conduct and encourage in the investigations relating to the problems related to water pollution and to enforce the law for the prevention, control and abatement of the water pollution.⁸⁷ It may lay down, modify or annul effluent standards for sewage and trade effluents and the quality of the receiving waters that may be the result of the discharge of effluents and it may also classify waters of the state. For the utilization of the sewage and trade effluents after treatment to be used in the agriculture it may encourage to evolve new methods so as to abate the pollution caused by the sewage and trade effluents.⁸⁸

The trade effluents and sewage must be disposed in the streams in such a way that it may decrease the degree of dilution as are necessary on account of the predominant conditions of disposal. It may lay down the standards for treatment of sewage and trade effluents to be discharged in any stream so that the sewage and trade effluent may not cross the tolerance limits of pollution as permissible in the water of the stream. The State Pollution Control Board may order any person to stop the use of any such system and may switch on to other remedial measures as required necessary

⁸⁶ The Water (Prevention and Control of Pollution) Act, 1974, Section 17.

⁸⁷ The Water (Prevention and Control of Pollution) Act, 1974, Section 23.

⁸⁸ The Water (Prevention and Control of Pollution) Act, 1974, Section 25.

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to prevent and control or abate water pollution. It may lay down effluent standards for preventing, controlling and abating the water pollution. It may also order to modify the effluent standard by a person who is causing discharge of sewage or sludge. It may advise the State Government about the industries that are causing the pollution of air and water. It may also perform the functions of the State Government and also the functions prescribed by the Central Pollution Control Board. To analyse the samples of water, the laboratories must also be established and recognised to be set up in the State by the State Pollution Control Boards.⁸⁹

3. POWERS OF THE STATE POLLUTION CONTROL BOARD

The State Pollution Control Boards have given the powers to obtain information, to take samples of the effluents produced from the factories for the effluent analysis, Power of entry and inspection. The State Pollution Control Boards have powers to refuse consent or withdraw any consent for the establishment of the Industry. If it seems to the Pollution Board that the new outlet is causing pollution of water it may impose restriction on that new outlet. It may have powers to make applications to the Courts for stopping the pollution or to stop the apprehended pollution to be caused to the water in streams or in wells.⁹⁰

The State Board is bound by the directions given by the Central Board or the State Government. The State Boards are required to specifically lay down effluent standards for Government undertakings, municipalities, and other local bodies which comply with these predetermined standards. The Act provides for a permit system or consent order to prevent the pollution of water. The Act generally prohibits disposal of polluting matter in streams, wells and sewers or on land in excess of standards established by the State Boards. The State Boards are authorized to give its consent after making inquiry in the prescribed manner. The preamble of the Water Act refers to restoring the wholesomeness of the water resources. The functions of State Boards specified by the Water Act not only include the planning a comprehensive programme for prevention, control and abatement of water pollution and encouraging, conducting and participating in investigation and research of water pollution problems in the

⁸⁹ Benny Joseph, *Environmental Studies*, 267 (McGraw Hill, India, 3rd Edn., 2017).

⁹⁰ The Water (Prevention and Control of Pollution) Act, 1974, Section 17 (i) a

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State. But also include inspection of the facilities for sewage and trade effluent treatment as well as developing economical and reliable methods of treatment of sewage and trade effluents.⁹¹

6.7. JOINT BOARDS

Chapter III of the Water (Prevention and Control of Pollution) Act, 1974, deals with the Constitution of Joint Board and its composition.

1. CONSTITUTION OF THE JOINT BOARD

Section 13 provides that Joint Board for a specified period, which can be further renewed, can be constituted by an agreement. The agreement may be entered into:⁹²

- (i) by two or more Governments of adjoining States; ⁹³or
- (ii) by the Central Government (in respect of one or more Union Territories) and one or more Government of States adjoining to such union territories.⁹⁴

An agreement under this section may-⁹⁵

- (i) provide for apportionment of the expenditure in connection with the Joint Board;
- (ii) determine that which of the participating Governments shall exercise and perform the several powers and functions under this Act;
- (iii) provide for consultation with reference to particular matters arising under this Act; and
- (iv) make such incidental and ancillary provisions, not inconsistent with this Act, as may be deemed necessary or expedient for giving effect to the agreement.

⁹¹ The Water (Prevention and Control of Pollution) Act, 1974, Section 18

⁹² The Water (Prevention and Control of Pollution) Act, 1974.

⁹³ The Water (Prevention and Control of Pollution) Act, 1974, Section 13 (1) a

⁹⁴ The Water (Prevention and Control of Pollution) Act, 1974, Section 13 (1) b

⁹⁵ The Water (Prevention and Control of Pollution) Act, 1974, Section 13 (2) a

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2. COMPOSITION OF THE JOINT BOARD⁹⁶

The Water (Prevention and Control of Pollution) Act, 1974, provides that a Joint Board be constituted by agreement between two or more Governments of adjoining States shall consist of the following members,⁹⁷ one full time chairman to be nominated by Central Government having a special knowledge or practical experience relating to environmental protection.⁹⁸ A person having knowledge and experience in administering institutions dealing with environment protection is also eligible.⁹⁹ Two persons to be nominated by the Central Government to represent the companies or corporations owned, controlled or managed by participating State Governments.¹⁰⁰ Two officials from each of the participating States to be nominated by the concerned participating State Government to represent that Government. To represent local authorities functioning within the State concerned, one person is nominated by each of the participating State Governments. To represent the interests of agriculture, fishery or industry or trade in the concerned state, one non-official member to be nominated by each of the participating state governments.¹⁰¹ One, full-time member-secretary, possessing qualifications, knowledge and experience of scientific, engineering or management aspects of pollution control, to be appointed by the Central Government.¹⁰²

6.8. ROLE OF THE POLLUTION CONTROL BOARDS REGARDING DISPOSAL OF WASTES

Pollution caused by the waste is one of the major problems that humanity is facing today. Industrialization, urbanization, increase in human population are responsible for the production of the waste. Pollution Control Boards act as barricades in controlling the production of waste in many ways which are as under:

⁹⁶ The Water (Prevention and Control of Pollution) Act, 1974, Section 14

⁹⁷ The Water (Prevention and Control of Pollution) Act, 1974, Section 14 (1)b

⁹⁸ The Water (Prevention and Control of Pollution) Act, 1974, Section 14 (1)c

⁹⁹ The Water (Prevention and Control of Pollution) Act, 1974, Section 1 (1)d

¹⁰⁰ Section 14 (1) (e), The Water (Prevention and Control of Pollution) Act, 1974.

¹⁰¹ Section 14 (1)(f), The Water (Prevention and Control of Pollution) Act, 1974.

¹⁰² Section 14 (1)(g), The Water (Prevention and Control of Pollution) Act, 1974.

E-WASTE MANAGEMENT: ROLE OF JUDICIARY AND POLLUTION CONTROL BOARDS

1. ROLE OF POLLUTION CONTROL BOARDS IN MANAGING HAZARDOUS WASTE

The term of the “hazardous waste” means any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, cause’s danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances.¹⁰³

Rule 4(6)¹⁰⁴ describes the responsibility of the occupier and operator of the facility as follows:

- (a) Contain contaminants and prevent accidents and limit their consequences on humans and the environment; and
- (b) Provide persons working on the site with information, training and equipment necessary to ensure their safety.

The “Proper authorization” by the State Pollution Control Board is really the control mechanism. As per Rule 5¹⁰⁵, this authorization letter or permit is issued to a man who is well versed in this technique and possesses proper and adequate facilities, technical capabilities and equipment to handle hazardous wastes safely.

2. GRANT OF AUTHORIZATION FOR HANDLING HAZARDOUS WASTES

Under Rule 6¹⁰⁶ every person who is engaged in generation, processing, treatment, package, storage, transportation, use etc. Of the hazardous waste shall be required to obtain an authorization from the State Pollution Control Board. The hazardous waste shall be collected, treated, re-cycled, re- processed, stored or disposal of only in the facilities authorized by the State Pollution Control Board.

Every Person engaged in the generation, treatment, package, storage, transportation, use collection, destruction, conversion, offering for sale, transfer or the like of the hazardous waste or occupier of the facility should seek authorization from

¹⁰³ Rule 3(17) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹⁰⁴ Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹⁰⁵ Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹⁰⁶ Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

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the State Pollution Control Board. If the State Board is satisfied that the applicant possesses appropriate facilities, technical capabilities and equipment to handle hazardous waste safely, it may grant authorization within 120 days and it shall be valid for a period of five years and shall be subject to such conditions as may be laid down. There shall be not import and export of hazardous wastes for dumping and disposal.¹⁰⁷

However, as an exception, such wastes may be permitted to be imported only as raw material for recycling or reuse. Such wastes can be used for processing and reuse as raw material only after procuring a proper permit from the State Pollution Control Board. In such a case, the exporting country should also inform and seek permission from the Central Government, which may be granted or refused. The occupier exporting or importing hazardous wastes from or to India shall comply with the Articles of Basel Convention to which India is a signatory. Further, the Ministry of Environment and Forests shall be the nodal agency to deal with trans- boundary movements of hazardous wastes.¹⁰⁸

The Central Government in exercise of the powers conferred on it by Sections 6, 8 and 25 of the Environment (Protection) Act, 1986 enacted these rules. These Rules lists various items of hazardous nature under the given Schedule and prescribes their quality beyond which an occupier generating hazardous wastes is not only liable to take all practical steps to ensure that such wastes are properly handled and disposed of without any adverse effects but also responsible for proper collection, reception, treatment, storage and disposal of these wastes either himself or through the operator of facility. Occupier is required that before the delivery of the hazardous waste, it should be packed in a manner suitable for storage and transport with the visibility of leveling and packing made in accordance with climate conditions.¹⁰⁹

¹⁰⁷ Rule 6 (2) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹⁰⁸ Rule 6 (3) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

¹⁰⁹ Rule 7 of The Hazardous Waste (Management and Handling) Rules, 1989

**E-WASTE MANAGEMENT: ROLE OF JUDICIARY AND POLLUTION
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**3. ROLE OF THE POLLUTION CONTROL BOARDS IN THE
MANAGEMENT AND TRANSBOUNDARY MOVEMENTS OF HAZARDOUS
WASTE**

Hazardous waste means any waste which by reason of any of its physical, chemical, reactive, toxic, inflammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes and substances. Sources of hazardous waste include those from industrial processes, mining extraction, pesticide based agricultural practices etc.

Hazardous waste, if not treated and disposed of properly can adversely affect the soil, air and water, especially ground water, in the area. Most hazardous wastes contain heavy metals which are toxic. They enter the human, animal body through food, water, air or absorption through the skin when they come in contact with humans in agriculture or industrial settings. They are not metabolized by the body are accumulated in the soft tissues. Grant of the Authorization, Registration for Recycling, Reprocessing or Reuse of Hazardous Wastes:¹¹⁰

Every person who is engaged in generation, processing, treatment, package, storage, transportation, use, collection, destruction, conversion, offering for sale, transfer or the like of hazardous waste shall require to obtain an authorization from the State Pollution Control Board. The occupier, recyclers, re-processors, re-users and operators of facilities may store the hazardous wastes for a period not exceeding ninety days and shall maintain a record of sale, transfer, storage, recycling and re-processing of such wastes and make these records available for inspection.¹¹¹ Finally the Ministry of Environment and Forests is the nodal Ministry to deal with the transboundary movement of the hazardous wastes and to grant permission for transit of the hazardous wastes through any part of India.

Every person desirous of recycling or reprocessing the hazardous waste specified in Schedule IV may make an application in Form 5 accompanied with a copy of consent to establish granted by the State Pollution Control Board under the

¹¹⁰ Vikas Vishisth, *Law and Practice of Environmental Laws in India* 281 (Bharat Law House Pvt. Ltd, 2002).

¹¹¹ Rule 6 (1) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

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Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution Act , 1981. The State Pollution Control Board or the Pollution Control Committee is being satisfied that the applicant is utilizing environmentally sound technologies and possesses adequate technical capabilities requisite facilities and equipment to recycle, reprocess or reuse hazardous wastes, may grant registration to such applicants stipulation therein necessary conditions for carrying out safe operations in the authorised place only.¹¹² The State Pollution Control Board or the Pollution Control Committee will have to dispose of the application for registration within a period of one hundred twenty days from the date of the receipt of such application complete in all respects.

The registration issued shall be valid for a period of five years from the date of its issue, unless the operation is discontinued by the unit or the registration is suspended or cancelled by the State Pollution Control Board or the Pollution Control Committee.¹¹³ The State Pollution Control Board or the Pollution Control Committee may cancel or suspend the registration granted under these rules, if it has reasons to believe that the recycler or re-processor has failed to comply with any of the conditions of the registration, or with any provisions of the Act or the rules made there under.¹¹⁴ The recycler or the re processor shall maintain records of hazardous wastes purchased and processed and shall file an annual return of its activities of previous year in Form 6 to the State Pollution Control Board, on or before the 30th day of June of every year.¹¹⁵ The registered trader shall be required to submit details of such import and particulars of the actual users along with quantities to the concerned state pollution Control Board or Pollution Control Committee on a quarterly basis and registration would be liable for cancellation on failure to furnish these details to the State Pollution Control Boards or Pollution Control Committees:

¹¹² Rule 13 (1) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹¹³ Rule 13 (2) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹¹⁴ Rule 14 (1) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹¹⁵ Rule 14 (1) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

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Provided that the registration granted to the trader shall not be cancelled unless he has been given a reasonable opportunity of hearing.¹¹⁶

4. IMPORT OF THE HAZARDOUS WASTE

Any person intending to import or transit for transboundary movement of hazardous wastes specified in Schedule III shall apply to the Central Government of the proposed import wherever applicable, together with the prior informed consent, which ever applicable and shall send a copy of the application, simultaneously, to the concerned State Board to enable them to send their comments and observations, if any, to Ministry of Environment and Forests within a period of thirty days.¹¹⁷

On receipt of the application in complete, the Ministry of Environment and Forests shall examine the application considering the comments and observations, if any, received from the State Boards, and may grant the permission for import within a period of sixty days subject to the condition that the importer has-¹¹⁸

1. The environmentally sound recycling, recovery or reuse facilities.
2. Adequate facilities and arrangements for treatment and disposal of wastes generated, and
3. A valid registration from the Central Pollution Control Boards and a proof of being an actual user, if required under these Rules.

The Ministry of Environments and Forests shall forward a copy of the permission granted under sub rule (3) to the Central Pollution Control Board, the concerned State Pollution Control Board and the concerned port and Customs authorities for ensuring compliance of the conditions of imports and safe handling of the hazardous waste.¹¹⁹ The importer of the hazardous waste shall maintain records of the hazardous waste imported by him in Form 10 and the record so maintained shall be available for inspection.

¹¹⁶ Rule 14 (4) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹¹⁷ Rule 13 (4) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹¹⁸ Rule 13 (5) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

¹¹⁹ Rule 14 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

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The importer shall also inform the concerned State Pollution Control Board and the Central Pollution Control Board, the date and time of the arrival of the consignment of the hazardous waste ten days in advance.¹²⁰

6.9. ROLE OF THE POLLUTION CONTROL BOARDS IN MANAGING THE E-WASTE

The revolution in information technology has resulted in a significant increase in the mass production, consumption and disposal of electronic products particularly those that have short life spans such as notebook computers and mobile phones. The legislative lacuna and consumerism set the background for the union government's recent draft guidelines on the disposal of E-waste, which was later termed as the E-Waste (Management) Rules, 2016, these Rules apply a cross section of society directly involved with products that generate E-waste as producers, dealers, collection centre, purchase and processing of electrical and electronic equipments.

1. PROCEDURE FOR SEEKING AND GRANT OF AUTHORISATION FOR E-WASTE MANAGEMENT

a. Authorisation of Producers¹²¹

(i) every producer of electrical and electronic equipment listed in Schedule I, shall make an application for Extended Producer Responsibility authorisation within a period of ninety days starting from the date of these rules coming into force in Form-1 to Central Pollution Control Board;¹²²

(ii) on receipt of the application complete in all respects, the Central Pollution Control Board will carry out evaluation of the Extended Producer Responsibility Plan and on being satisfied that the producer has detailed out an effective system to manage Extended Producer Responsibility in the country, shall grant Extended Producer Responsibility authorisation, in Form 1(aa), within a period of one hundred and

¹²⁰ Rule 14 (5) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

¹²¹ Rule 13 of the E-Waste (Management) Rules, 2016.

¹²² Rule 13(1) (i) of the E-Waste (Management) Rules, 2016.

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twenty days. The Extended Producer Responsibility authorisation shall be valid for a period of five years;¹²³

This authorisation shall include among others the targeted quantity of e-waste, product code wise, to be collected during the year. The actual target for collection of E-waste for dismantling or recycling will be fixed on the basis of quantity of electrical and electronic equipment, product code wise, placed in the market in the previous years and taking into consideration the average life of the equipment. The estimated quantity of e-waste generated during the current year will be indicated by the producer and the quantity expected to be collected with the collection scheme proposed to be implemented by the producer will be indicated in the Extended Producer Responsibility plan. The Central Pollution Control Board shall fix the targets in accordance with Schedule III.

(iii) the Central Pollution Control Board, after giving reasonable opportunity of being heard to the applicant shall refuse to grant Extended Producer Responsibility authorisation;¹²⁴

(iv) in the event of refusal of Extended Producer Responsibility - Authorisation by the Central Pollution Control Board, the producer will forfeit his right to put any Electrical and Electronic Equipment in the market till such time the Extended Producer Responsibility - Authorisation is granted;¹²⁵

(v) the Central Pollution Control Board after grant of Extended Producer Responsibility - Authorisation shall forward the Extended Producer Responsibility Plan to respective State Pollution Control Board for monitoring;¹²⁶

(vi) an application for the renewal of Extended Producer Responsibility-Authorisation shall be made in Form-1 before one hundred and twenty days of its expiry to Central Pollution Control Board. The Central Pollution Control Board may renew the authorisation for a period of five years after receipt of compliance report from the concerned State Pollution Control Board which shall submit the compliance report to

¹²³ Rule 13(1) (ii) of the E-Waste (Management) Rules, 2016.

¹²⁴ Rule 13(1) (iii) of the E-Waste (Management) Rules, 2016.

¹²⁵ Rule 13(1) (iv) of the E-Waste (Management) Rules, 2016.

¹²⁶ Rule 13(1) (v) of the E-Waste (Management) Rules, 2016.

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Central Pollution Control Board within sixty days from the date of the receipt of the application.¹²⁷

(vii) every producer of Electrical and Electronic Equipment listed in Schedule I, shall take all steps, wherever required, to comply with the conditions specified in the Extended Producer Responsibility – Authorisation;¹²⁸

(viii) the concerned State Pollution Control Board shall monitor the compliance of Extended Producer Responsibility; Authorisation, take cognizance of any noncompliance and inform Central Pollution Control Board for taking action, as necessary;¹²⁹

(ix) Central Pollution Control Board shall conduct random check and if in its opinion, the holders of the Extended Producer Responsibility - Authorisation has failed to comply with any of the conditions of the authorisation or with any provisions of the Act or these rules and after giving a reasonable opportunity of being heard and after recording reasons thereof in writing cancel or suspend the Extended Producer Responsibility - Authorisation issued under these rules for such period as it considers necessary in the public interest and inform the concerned State Pollution Control Board within ten days of cancellation.¹³⁰

(x) the Central Pollution Control Board shall maintain an online register of Extended Producer Responsibility-Authorisation granted with conditions imposed under these rules for environmentally sound management of e-waste, and which shall be accessible to any citizen of the country.¹³¹

(xi) The producer authorised under the provision of this rule shall maintain records in Form-2 and shall file annual returns of its activities of previous year in Form-3 to the Central Pollution Control Board on or before 30th day of June of every year;¹³²

¹²⁷ Rule 13(1) (vi) of the E-Waste (Management) Rules, 2016.

¹²⁸ Rule 13(1) (vii) of the E-Waste (Management) Rules, 2016.

¹²⁹ Rule 13(1) (viii) of the E-Waste (Management) Rules, 2016.

¹³⁰ Rule 13(1) (ix) of the E-Waste (Management) Rules, 2016.

¹³¹ Rule 13(1) (x) of the E-Waste (Management) Rules, 2016.

¹³² Rule 13(1) (xi) of the E-Waste (Management) Rules, 2016.

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b. Authorisation of Manufacturer

(i) the manufacturer generating e-waste shall obtain an authorisation from the concerned State Pollution Control Board;¹³³

(ii) the manufacturer shall make an application for authorisation, within a period of ninety days from the date of these rules coming into force in Form 1(a) to the concerned State Pollution Control Board for grant of authorisation;¹³⁴

(iii) on receipt of the application complete in all respects for the authorisation, the concerned State Pollution Control Board may, after such enquiry as it considers necessary and on being satisfied that the applicant possesses appropriate facilities, technical capabilities and equipment to handle e-waste safely, grant within a period of one hundred and twenty days an authorisation in Form 1(bb) to the applicant to carry out safe operations in the authorised place only, which shall be valid for a period of five years;¹³⁵

(iv) the concerned State Pollution Control Board after giving reasonable opportunity of being heard to the applicant may refuse to grant any authorisation;¹³⁶

(v) every person authorised under these rules shall maintain the record of E-waste handled by them in Form-2 and prepare and submit to the concerned State Pollution Control Board, an annual return containing the details specified in Form 3 on or before the 30th day of June following the financial year to which that return relates¹³⁷;

(vi) an application for the renewal of an authorisation shall be made in Form-1(a) before one hundred and twenty days of its expiry and the concerned State Pollution Control Board may renew the authorisation for a period of five years after examining each case on merit and subject to the condition that there is no report of violation of the provisions of the Act or the rules made there under or the conditions specified in the authorisation;¹³⁸

¹³³ Rule 13(2) (i) of the E-Waste (Management) Rules, 2016.

¹³⁴ Rule 13(2) (ii) of the E-Waste (Management) Rules, 2016.

¹³⁵ Rule 13(2) (iii) of the E-Waste (Management) Rules, 2016.

¹³⁶ Rule 13(2) (iv) of the E-Waste (Management) Rules, 2016.

¹³⁷ Rule 13(2) (v) of the E-Waste (Management) Rules, 2016.

¹³⁸ Rule 13(2) (vi) of the E-Waste (Management) Rules, 2016.

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(vii) Manufacturer shall take all steps to comply with the conditions specified in the authorisation;¹³⁹

(viii) The concerned State Pollution Control Board shall maintain an online register of authorisations granted with conditions imposed under these rules for 12 environmentally sound management of e-waste, and which shall be accessible to any citizen of the country.¹⁴⁰

c. Procedure for grant of authorisation to dismantler or recycle

(i) Every person desirous of recycling or reprocessing the E-waste shall make an application, within a period of one hundred and twenty days starting from the date of coming into force of these rules, in Form 4 accompanied with a copy of consent the State Pollution Control Board.¹⁴¹

(ii) The State Pollution Control Board or the Pollution Control Committee is being satisfied that the applicant is utilizing environmentally sound technologies and possesses adequate technical capabilities requisite facilities and equipment to recycle, reprocess or reuse e-wastes, may grant registration to such applicant's stipulation therein necessary conditions for carrying out safe operations in the authorised place only¹⁴².

(iii) The State Pollution Control Board or the Pollution Control Committee will have to dispose of the application for registration within a period of one hundred twenty days from the date of the receipt of such application complete in all respects¹⁴³.

(iv) the authorisation granted under these rules shall be valid for a period of five years from the date of its issue and shall be accompanied with a copy of the field inspection report signed by that Board indicating the adequacy of facilities for dismantling or recycling of e-waste and compliance to the guidelines specified by Central Pollution Control Board from time to time;¹⁴⁴

¹³⁹ Rule 13(2) (vii) of the E-Waste (Management) Rules, 2016

¹⁴⁰ Rule 13(2) (viii) of the E-Waste (Management) Rules, 2016

¹⁴¹ Rule 13(3) (i) of the E-Waste (Management) Rules, 2016

¹⁴² Rule 13(3) (ii) of the E-Waste (Management) Rules, 2016

¹⁴³ Rule 13(3) (iii) of the E-Waste (Management) Rules, 2016

¹⁴⁴ Rule 13(3) (iv) of the E-Waste (Management) Rules, 2016

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(v) the concerned State Pollution Control Board may refuse, cancel or suspend an authorisation granted under these rules, if it has reasons to believe that the authorised dismantler or recycler has failed to comply with any of the conditions of authorisation, or with any provisions of the Act or rules made there under, after giving an opportunity to the dismantler or recycler to be heard and after recording the reasons thereof;¹⁴⁵

(vi) an application for the renewal of authorisation shall be made in Form 4 before one hundred and twenty days of its expiry and the concerned State Pollution Control Board may renew the authorisation for a period of five years after 13 examining each case on merit and subject to the condition that there is no report of violation of the provisions of the Act or the rules made there under or the conditions specified in the authorisation;¹⁴⁶

(vii) the Dismantler and Recycler shall maintain records of the e-waste purchased, processed in Form-2 and shall file annual returns of its activities of previous year in Form-3 to the concerned State Pollution Control Board on or before 30th day of June of every year;¹⁴⁷

(viii) the Central Government and the Central Pollution Control Board may issue guidelines for standards of performance for dismantling and recycling processes from time to time.¹⁴⁸

d. Procedure for grant of authorisation to refurbisher

(i) Every refurbisher of e-waste shall make an application, within a period of one hundred and twenty days starting from the date of coming into force of these rules, in Form 1 (a) in triplicate to the concerned State Pollution Control Board.¹⁴⁹

(ii) the concerned State Pollution Control Board, on being satisfied that the application is complete in all respects and complies with the guidelines prescribed by Central Pollution Control Board from time to time, may grant one time authorisation

¹⁴⁵ Rule 13(3) (v) of the E-Waste (Management) Rules, 2016

¹⁴⁶ Rule 13(3) (vi) of the E-Waste (Management) Rules, 2016

¹⁴⁷ Rule 13(3) (vii) of the E-Waste (Management) Rules, 2016

¹⁴⁸ Rule 13(3) (viii) of the E-Waste (Management) Rules, 2016

¹⁴⁹ Rule 13(4) (i) of the E-Waste (Management) Rules, 2016

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in Form 1 (bb) to such applicants stipulating therein necessary conditions as deemed necessary for carrying out refurbishing activities in the authorised place only;¹⁵⁰

(iii) The concerned State Pollution Control Board shall dispose of the application for authorisation within a period of one hundred and twenty days from the date of the receipt of such application complete in all respects;¹⁵¹

(iv) the concerned State Pollution Control Board may refuse, cancel or suspend a authorisation granted under these rules, if it has reasons to believe that the authorised refurbisher has failed to comply with any of the conditions of authorisation, or with any provisions of the Act or rules made thereunder, after giving an opportunity to the refurbisher to be heard and after recording the reasons thereof;¹⁵²

(v) The refurbisher shall maintain records of the e-waste purchased and refurbished in Form-2 and shall file annual returns of its activities of previous year in Form-3 to the concerned State Pollution Control Board on or before 30th day of June of every year.¹⁵³

e. Power to suspend or cancel an authorisation

(1) The State Pollution Control Board may, if in its opinion, the holder of manufacturer or dismantler or recycler or refurbisher authorisation has failed to comply with any of the conditions of the authorisation or with any provisions of the Act or these rules and after giving a reasonable opportunity of being heard and after recording reasons thereof in writing cancel or suspend the authorisation issued under these rules for such period as it considers necessary in the public interest and inform Central Pollution Control Board within ten days of cancellation;¹⁵⁴

(2) The Central Pollution Control Board, if in its opinion, the holders of the Extended Producer Responsibility- Authorisation has failed to comply with any of the conditions of the authorisation or with any provisions of the Act or these rules and after giving a reasonable opportunity of being heard and after recording reasons

¹⁵⁰ Rule 13(4) (ii) of the E-Waste (Management) Rules, 2016

¹⁵¹ Rule 13(4) (iii) of the E-Waste (Management) Rules, 2016

¹⁵² Rule 13(4) (iv) of the E-Waste (Management) Rules, 2016

¹⁵³ Rule 13(4) (v) of the E-Waste (Management) Rules, 2016

¹⁵⁴ Rule 14(1) of the E-Waste (Management) Rules, 2016

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thereof in writing cancel or suspend the Extended Producer Responsibility-Authorisation issued under these rules for such period as it considers necessary in the public interest and inform State Pollution Control Boards or Pollution Control Committees within ten days of cancellation;¹⁵⁵

(3) Upon suspension or cancellation of the authorisation, the Central Pollution Control Board or State Pollution Control Board may give directions to the persons whose authorisation has been suspended or cancelled for the safe storage and management of the e-waste and such persons shall comply with such directions.¹⁵⁶

f. Reduction in the use of hazardous substances in the manufacture of electrical and electronic equipment and their components or consumables or parts or spares

(1) Every producer of electrical and electronic equipment and their components or consumables or parts or spares listed in Schedule I shall ensure that, new electrical and electronic equipment and their components or consumables or parts or spares do not contain Lead, Mercury, Cadmium, Hexavalent Chromium, and polybrominated diphenyl ethers beyond a maximum concentration value of 0.1% by weight in homogenous materials.¹⁵⁷

(2) Central Pollution Control Board shall conduct random sampling of electrical and electronic equipment placed on the market to monitor and verify the compliance of Reduction of Hazardous Substances provisions and the cost for sample and testing shall be borne by the Producer. The random sampling shall be as per the guidelines of Central Pollution Control Board.¹⁵⁸

(3) If the product does not comply with Reduction of Hazardous Substances provisions, the Producers shall take corrective measures to bring the product into compliance and withdraw or recall the product from the market, within a reasonable period as per the guidelines of the Central Pollution Control Board.¹⁵⁹

¹⁵⁵ Rule 14(2) of the E-Waste (Management) Rules, 2016

¹⁵⁶ Rule 14(3) of the E-Waste (Management) Rules, 2016

¹⁵⁷ Rule 16(1) of the E-Waste (Management) Rules, 2016

¹⁵⁸ Rule 16(9) of the E-Waste (Management) Rules, 2016

¹⁵⁹ Rule 16(10) of the E-Waste (Management) Rules, 2016

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(4) Central Pollution Control Board shall publish the methods for sampling and analysis of Hazardous Substances as listed in sub-rule(1) of rule 16 with respect to the items listed in Schedule I and II and also enlist the labs for this purpose.¹⁶⁰

g. Annual Report

(1) The concerned State Pollution Control Board shall prepare and submit to the Central Pollution Control Board an annual report with regard to the implementation of these rules by the 30th day of September every year in Form-VI.¹⁶¹

(2) The Central Pollution Control Board shall prepare the consolidated annual review report on management of E-waste and forward it to the Central Government along with its recommendations before the 30th day of December every year.¹⁶²

6.10. CONCLUSION

The judiciary has shown its deep concern for the protection of environment from hazardous wastes and E-waste. Indian Courts of law has established new principles of law and also introduced innovations in the environmental justice delivery system. It is a blunt truth that more than the legislative and administrative measures the “Judicial Activism” supported by public interest litigation (PIL) has served the cause of environmental protection and the pollution free environment. The emphasis of the judiciary has been on sustainable development and it has strictly applied the “precautionary principal” as well as the “polluter pays principle”. The judiciary while interpreting ‘Right to Life’ under Article 21 of the Constitution has now approved the right to live in a pollution free and healthy environment as fundamental rights. There are several vocal NGO’s and public-spirited individuals who have moved the courts to seek relief against numerous problems such as those created by negligence in management of E-waste. Acting either at the instance of petitioners or on their own, the Supreme Court has invoked Article 32 of the Constitution to grant remedies to restrain harmful activities in many cases. Reliance has also been placed on the power to do complete justice under Article 142 to issue detailed guidelines to executive agencies and private parties for ensuring the

¹⁶⁰ Rule 16(11) of the E-Waste (Management) Rules, 2016

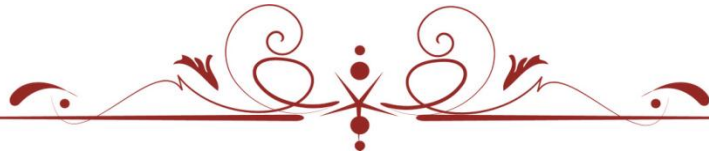
¹⁶¹ Rule 18(1) of the E-Waste (Management) Rules, 2016

¹⁶² Rule 18(2) of the E-Waste (Management) Rules, 2016

E-WASTE MANAGEMENT: ROLE OF JUDICIARY AND POLLUTION CONTROL BOARDS

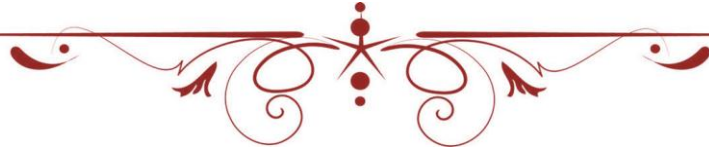
implementation of the various environmental statutes and judicial directions. NGT has also played an important role in the management of E-waste in India.

The Pollution Control Boards have introduced a sense of discipline among the industries. Through the law envisages most stringent enforcement machinery with heavy hurdles in the way of administration of environmental laws. So, for preserving the environment and providing fresh air and pure water, administrative urgency is also needed along with legislative militancy.



CHAPTER-VII

CONCLUSION AND SUGGESTIONS



CHAPTER-VII

CONCLUSION AND SUGGESTIONS

7.1. CONCLUSION

Electronics industry is the world's largest and fastest growing manufacturing industry. Rapid growth combined with rapid product obsolescence resulted in discarded electronics which is now the fastest growing waste stream in the industrialized world. The growing quantity of E-waste from electronic industry is beginning to reach disastrous proportions. Electronic Waste or E-waste is the term used to describe old, end-of-life electronic appliances such as computers, laptops, TVs, DVD players, refrigerators and freezers, mobile phones, MP3 players, etc.

There is no particular definition of electronic waste or E-waste, however, the definition based on the directive, which the EU has set out in Article (b) on electronic waste is considered most accurate. (Mention the definition given in EU directive) The Basel Convention or the Basel Convention on the Control of Transboundary Movements of Hazardous wastes and their Disposal considers that most electrical and electronic equipments have contaminants, which will become hazardous wastes when they expire. Moving the remains of pieces of electronic waste is necessary to comply with the obligations under the Basel Convention.

Although electronic waste is classified as hazardous waste, which has to be controlled, maintained, and managed in accordance with the guidelines and principles of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, which has entered into force since 1989, for guidelines on the export of hazardous waste, and the responsibilities of the state of export of hazardous waste to inform, and get approval from the state of the recipient, or the state, which is the passage way before the export of waste. However, at present, some countries do not have specific law that applies to electronic waste directly. Meanwhile, Asian countries have realized the recycling of electronic waste for reuse solutions. Some countries have clear legislation on this issue while some countries are studying it to find appropriate solutions.

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India can bring domestic laws related to tackle the issue of electronic waste which can be based on the Basel Convention, and can be implemented, like the Hazardous Waste (Management and Handling) Rule, 2003, The Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, Guidelines for Environmentally Sound Management of E-waste, 2008, The Hazardous and other wastes (Management and Transboundary Movement) Rules, 2016, E-waste (Management and Handling) Rules, 2011, and The E-waste (Management) Rules, 2016, India and so on.

The study and analysis about the problem of disposal of E-waste with the end-of-life of electrical and electronic equipment makes it evident that India has taken measures to solve problems and deal with such issues as well. The E-waste (Management) Rules, 2016 has meaning and definition of the word “end-of-life”. Under Rule 3 (n), that is “end-of-life” of the product means the time when the product is intended to be discarded by the user. In addition, there are also the responsibilities of the producer and consumer or bulk consumer about the end-of-life of electrical and electronic equipment, under Rule 5 (1) (a), (b) and (e), Rule 5 (2) and Rule 9 (3).

In addition, to the measures in E-waste (Management) Rules, 2016 about the end-of-life of electrical and electronic of equipment, there are measures about the label on the product, which are provided in the hazardous and other waste (Management and Transboundary Movement) Rules, 2016, to apply management and control problems with the end-of-life of electrical and electronic equipment, which is given under Rule 17 (1) and Rule 18 (2).

Therefore, the study of the problem shows that India has two editions of the Rules in order to solve problems and manage and control on the end-of-life of electrical and electronic equipment, that is the E-waste (Management) Rules 2016 and the hazardous and other waste (Management and Transboundary Movement) Rules, 2016. For the management and control of this problems, the E-waste (Management) Rules, 2016 has meaning and definition, as well as the responsibility of the producer and consumer or bulk consumer clearly and the hazardous and other waste (Management and Transboundary Movement) Rules, 2016 defines the label to use to manage and control such problems as well.

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The development of environmental jurisprudence in India is largely the story of judiciary responding to complaints of its citizens against environmental degradation and administrative sloth. Over the years, the Apex Court has been paying special attention, for the protection of environment by giving effective directions to all the persons concerned with the matter by invoking in powers under the Article 32 and Article 226 of Indian Constitution. Judicial response to almost all environmental litigations has been very positive in India. Public Interest Litigation has become very popular in the field of environment. For the proper management of E-waste and protection of the environment from pollution, the Supreme Court, NGT and various High Courts of India have taken innumerable measures in a series of their judgments. Contrary to the past practices, the position today is that a person acting bonafide and having a sufficient interest can move the courts for redressing public injury, enforcing public duty, protecting social and collective rights and vindicating public interests.

7.2. LEGAL ISSUES REGARDING ELECTRONIC WASTE CAN BE IDENTIFIED, AS FOLLOW:

1. The Basel Convention on hazardous waste items that are defined in Appendix IV of the Convention and the list of such types of electronic waste are included, but the countries still do not have clearly defined categories of electronic waste. Thus, in the list given by the Convention is still not comprehensive and if some countries do not have legislation in relation to electronic waste directly, which results in the transmission of e-waste items without the need to comply with the Basel Convention. Some entrepreneurs turned to how to collect and smuggle out by leaving them underdeveloped countries, because they do not meet the criteria or conditions set forth in the Convention.
2. The E-waste (Management) Rule, 2016 has no definition of electronic waste or hazardous waste, the definition of the word “waste and hazardous substance”, which is associated to it consecutively. Considering the above discussion a hazardous substance under the law has a similar meaning to that given under the Hazardous Substance Act, 1992. So hazardous electronic waste is one that needs to be controlled in terms of import and export, which have been carried out and the other measures to be able to act without having to announce

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further. However, if the provisions and the measures of the law, which is seen as more flexible in some aspects, such as the law in terms of management is to empower the commission to take action in the appropriate jurisdiction of duties, and be able to exercise discretion in the implementation of the regulations apply, such guidelines, which can be used to perform the control and management of electronic waste.

3. The E-waste (Management) Rules, 2016 only stipulates that “Subject to other provisions of these rules, the authorities shall perform duties as specified in Schedule IV”, which discusses the power to manage and control the import and export of electronic waste to the Customs Department or authority of Customs Department, under the Indian the Custom Act, 1962. Moreover, the E-waste (Management) Rules, 2016, has no provision on the import and export of electronic waste at all, which need to take the hazardous and other waste (Management and Transboundary Movement) Rules, 2016 which has provisions on the import and export of hazardous and other waste instead. The hazardous and other waste (Management and Transboundary Movement) Rules, 2016 has provision regarding import and export of hazardous and other waste clearly and directly, such as under Rule 12 (1), that is “No import of the hazardous and other wastes from any country to India for disposal shall be permitted”. Therefore, it can be seen that there are difficulties in the use and interpretation of the text of the E-waste (Management) Rules, 2016 to be applied to the problems that arise on the scope of law enforcement about import and export of electronic waste.
4. Management of hazardous municipal waste is a challenge in itself. Added to this burden is the management of huge and growing quantities of electrical and electronic waste emerging as one of the most important environmental problems of developing countries, especially India. According to ASSOCHAM estimates that India will generate 5.2 million tonnes of E-waste by 2020. E-waste has become more of a problem than all other wastes because of the very significant health and environment hazards associated with it. These enormous quantities in combination with the fact that E-waste contains a wide range of hazardous compounds have turned E-waste into a global environmental issue. When the E-waste is not taken care of appropriately,

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either in general wastes processes or in recycling processes, these hazardous compounds may be released and thereby become a threat to humans and the environment. In addition, in some processes used, new hazardous compounds, such as dioxins, may be formed as the original E-waste components are degraded. Consequently, to avoid serious impacts on human health and the environment it is crucial to ensure that E-waste is properly taken care of, all the way from collection and handling through recycling and disposal.

5. E-waste assumes significance due to its complex and toxic nature, also due to low public awareness the actual impact is being constantly ignored by the general public and the policy makers. Apart from the awareness another concerning factor is the loss of scarce metals present in E-waste, the demand for minerals used in the manufacture of electronics has to be compensated for by intensified mining activities, which in turn has given rise to conflicts for these resources worldwide. The E-waste handling and recycling industry could play an important role in reducing such conflict risks by lowering the pressure on primary mining sites, such as those of gold, palladium and tantalum and decreasing the environmental burden.
6. This problem stems from the fact that the country has legislation on electronic waste, such as the European Union, which measures the force required to classify and separate waste by recycling or reuse systems. Because of implementation of such a high cost when it is updated and re-used, it is usually not very popular. It needs to be ensured that recycled electronic products are durable as well as value for money when compared with new products.
7. The transmission of second hand goods in electrical and electronic equipment or components, equipment or spare parts are not requirements of the Basel Convention, the importer or exporter must comply with certain conditions or requirements, stating that “the export of hazardous waste must be approved in writing by the destination country, and the state exporter of hazardous waste is required to ensure, that the country has the capacity to manage hazardous waste without harm to the environment, including requiring the preparation of system documentation, removal of hazardous waste, a process to inform the importer consent prior to export, where hazardous waste from the state party of origin, and notify transposition, notify results of the permit or prohibit

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transport, monitoring, packaging, and transportation of hazardous waste across borders, control and management of hazardous waste in the country”, because second hand goods in electrical and electronic equipment or components, equipment or spare parts cannot be classified as hazardous waste, so that industrialized countries will use the transmission of second hand goods in electrical and electronic equipment or components, equipment or spare parts to be sold (dumped) to developing countries, which are used in developing countries but for a short time only. Then, second hand goods in electrical and electronic equipment or components, equipment or spare parts, will become electronic waste in the country, which received the E-waste, and tends to increase every year.

8. The E-waste (Management) Rules, 2016, does not have rules about used or second hand products, but the hazardous and other waste (management and transboundary movement) Rules 2016 has rules on the import and export of hazardous and other waste, which is provided in Rule 3 (1), (17) (iii), (23), 12, 13 and 14 and such measures can be adapted for use in relation to raw materials and products as well.
9. The hazardous and other waste (management and transboundary movement) Rules 2016, keeping in mind that “the Act or Rules of India”, which has come to the prevention and management in used to be imported from abroad as well, even though such legislation is not provided in E-waste (Management) Rules, 2016 directly, but was able to take the measures mentioned in the hazardous and other waste (Management and Transboundary Movement) Rules, 2016 adapted very well and efficiently, which will help reduce certainly if it is complied strictly.
10. The scheduled expiration of electronic products, (End-of-life of E-waste) is not clearly defined in each country. In particular, Scheduled expiration of electronic products in developing countries is different from countries, which have advancements in technology. This difference creates problems while applying penal measures on operators. The operator shall be responsible for the costs themselves, which is a cost that the operator cannot push to the consumer. Thus, the operator uses the difference in the end as a guide to evade the law.

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11. India, which does not have the specific law for E-waste directly but the government made Rules about the E-waste under the Environment Protection Act, which has the meaning and the definition of “E-waste” and there is stipulation to the related person for taking responsibility clearly. However, in this rule there is no stimulate for management and handling that concern with the import-export E-waste, therefore, India should legislate the specific law instead of the rule of e-waste and should add the management and control of the transportation and import e-waste to regulate in this law, in order to make the law clearly and can bring it for using in control and manage e-waste more efficiency.

From the research, the basic questions and the purpose about the Legal framework on Electronic Waste management, both national and International which have an impact on the environment and human health can be answered. It can tell us about pros and cons of both Indian and International law regarding e-waste. It can tell us about how to manage and control electronic waste or E-waste including legislating new law or Act for solution of these problems. This research showed about what is the problem of application of law in India, nowadays.

7.3. SUGGESTIONS

On the basis of above conclusion, the researcher has laid down some suggestions:-

1. BAN HAZARDOUS WASTE EXPORTS

The most immediate recommendation consistent with the Basel Ban Amendment decision by the Basel Convention to ban all exports of hazardous wastes from OECD (Organization for Economic Cooperation and Development) to non-OECD countries is to ban such all exports of E-Wastes that are hazardous wastes including computer monitors, whole computers, and circuit boards. It is unacceptable that India, one of the world's most waste producing nations, has not yet ratified the Basel Convention and the Basel Ban Amendment that were passed by a consensus of all of the Parties. Even in the absence of actual ratification of the agreements, the India must implement these decisions and do so immediately. India must practice environmental justice on the global stage. The poor of the world should not have to

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bear a disproportionate burden of environmental risk-particularly when they have not benefited from the products and services that created that risk. All industrialized countries of the world should become self-sufficient in managing their own hazardous wastes so that they will not victimize other peoples, particularly in developing countries, but moreover so that they will realize an immediate incentive to eliminate such hazards at the source. Developing nations should be given the tools and training necessary to develop preventative waste management strategies.

2. MAKE THE EXTENDED PRODUCER RESPONSIBILITY

Increasingly it is being recognized that producers of products must be financially, physically or legally responsible for their products. The principle of “Extended Producer Responsibility” (EPR) requires continuing accountability on producers over the entire lifecycle of their products. This is an absolutely necessary policy as it has been too easy in the past for manufacturers of products to externalize environmental costs to the public, to consumers, to developing countries and future generations without those burdens ever being realized or accounted for by those responsible for them. The aim of EPR is to encourage producers to prevent pollution and reduce resource and energy use in each stage of the product life cycle through changes in product design and process technology.

By ensuring this feedback to the producer and by making them financially responsible for end-of-life waste management, producers will have a financial incentive to design their products with less hazardous and more recyclable materials. Currently the expense of collecting, managing and disposing of discarded electronics, including household hazardous waste collection and hazardous waste site clean-up is born by taxpayer funded government programs, primarily at the local level. Manufacturers and distributors should assume responsibility for these costs, so that they can be internalized and reflected in the product prices. This change in the market economics in effect the internalization of costs that were previously passed off to the public-will create powerful incentives for manufacturers of electronics to reduce such costs by designing products that are clean, safe, durable, reusable, repairable, upgradeable, and easy to disassemble and recycle. There are many mechanisms to ensure EPR.

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3. NEED FOR STRINGENT HEALTH SAFEGUARDS AND ENVIRONMENTAL PROTECTION LAWS IN INDIA

Environmental activists opine that environment protection laws in India are not stringent enough to address the issues relating to either domestic waste or imports of hazardous waste including e-waste. We do not have appropriate technology to ascertain the quantum and quality of wastes in the imported items. For instance, it has been reported that the problem of toxic waste imports cannot be addressed properly as none of the Indian ports has scanners to detect the actual contents of the consignments. There are expectations that E-waste (Management and Handling) Rules, 2016 will lay down explicit laws concerning E-waste and systematize various aspects of the e-waste recycling sector.

The Government has consulted various non- governmental organizations (NGOs) in the process of developing a dedicated set of rules, which would govern the management and handling of electronic and electrical waste. It is necessary that the legislation is clear in laying down the responsibility of every shareholder in the management of waste-from the producer to the consumer and the recycler. Besides, any legislation to be effective requires clear specification of the mechanisms to carry out each function. Strategies have been proposed for the effective management and handling of e-waste in the country, many of which are already in force or in consideration in the EU countries and other developed countries like the U.S. and Japan.

4. DEVELOPING INNOVATIVE METHODS AND TECHNOLOGIES FOR PROCESSING NEW FORMS OF E-WASTE

The composition of e-waste is changing rapidly as new electrical and electronics devices enter the market. This requires significant investment in research and development for innovative recycling methods and technologies for future-proofing India's E-waste policies and management. For example, smart phone usage has expanded dramatically in India over the past five years, but the lithium-ion batteries that power these devices are not yet covered by any E-waste recycling rules. There are various new battery and materials technologies being developed for manufacturing next generation electronic devices. It is thus critical for the Indian

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government to promote and fund research that develops innovative, future-oriented technologies for recycling and transforming new E-waste streams into high value products.

5. MONITORING OF COMPLIANCE OF E-WASTE RULES

The State Pollution Control Boards or Committees responsible for grant of authorization, monitoring compliance of authorization and registration conditions can take action against violations of rules. On the other hand, the Central Pollution Control Board (CPCB) can monitor the compliance of conditions stipulated for granting registration. In this regard, as per the E-waste Rules, producers, dismantlers, recyclers & collection centres, are required to seek authorization and registration from the State Pollution Control Board (SPCB) concerned and file annual returns. SPCBs are required to submit annual reports to CPCB. Central Pollution Control Board will consolidate the information received from all SPCB and submit an annual report on e-waste management, along with its recommendations, to the Ministry.

6. AWARENESS PROGRAMME

Intervention Seminar producers of electrical and electronic equipment in India, to receive comments, actions initiated measures to control, restrict and electronic waste by allowing the producers to participate. However, due to the current operators are also required to take electronic devices are raw materials, or to have taken on a different E-waste away. Moreover, the implementation of the control measures that work should allow operators to participate in awareness and information, facts, and opinions are needed, which ensures that the measures adopted are effective and have been cooperating for more.

7. REQUIRE PRODUCERS TO TAKE IT BACK

The model example of EPR is product take-back where a producer takes back a product at the end of its useful life (i.e., when discarded) either directly or through a third party. However, product take and back needs to go hand-in-hand with mandatory legislation to phase out E-waste. Take and back for E-waste is necessary to place the burden of a product's environmental impact clearly back into the hands of those who design it in order to provide immediate incentive for improvement. It is also necessary

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to provide downstream consumers and local governments with an immediate answer to the question, “What can I ethically do with this obsolete machine.”

Clearly, in the case of E-waste, as demonstrated in this report, an immediate and ethical choice is needed as a matter of urgency. Should we place our old computers in landfills? No. Should we give it away to a recycler or broker who will simply turn around and export it to some other countries? No. The obvious answer is that manufacturers must be required to take these products back and devise and implement environmentally sound and ethical recycling/re-use solutions. The ultimate aim is to close the loop of the product life cycle so that producers, who manufacture the product in the first place and who are ultimately in charge of designing the product, assume full responsibility for life cycle costs. Thus, as consumers, we must demand that corporations make available and transparent mechanisms for product take and back. This free-of-charge take back should include products that are obsolete or broken. Many grassroots groups around the country have come together to develop a comprehensive platform to address the growing E-Waste crisis. Called the Electronic Take It Back, Platform, it has been endorsed by hundreds of groups around the Country and throughout the world for the full platform and a chance to sign on and participate.

8. GET THE POISONS OUT

Pollution prevention does not just mean recycling waste already produced rather it means clean production producing less quantity of waste and less hazardous waste in the first place. Recycling has an important role to play in reducing the E-waste crisis, but recycling can hardly be seen as the only solution particularly when hazardous inputs are involved. Recycling hazardous waste often involves re-exposing the environment and our health to hazards via either pollution or re-introduction into products where the recycled waste will eventually surface later as pollution. If E-waste were not hazardous, it would still be a nuisance but it would no longer be deadly and destructive to human health and viable ecosystems. Likewise, if the process of manufacturing computers were done cleanly without hazardous inputs and processes, it would be possible to overcome the worst of the high-tech environmental nightmare.

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Clearly then, the first and most important solution to the E-waste crisis involves getting the poisons out. Before that happens, manufacturers of computer monitors, televisions and other electronic devices containing hazardous materials must be responsible for educating consumers and the general public regarding the potential threat to public health and the environment posed by their products and for raising awareness for the proper waste management protocols. At a minimum, all computer monitors, television sets, and other electronic devices containing hazardous materials must be clearly labelled to identify environmental hazards and proper materials management.

9. DESIGN FOR LONGEVITY, UPGRADABILITY, REPAIR AND RE-USE

Once the hazardous inputs are eliminated, the next priority is to counter the rapid obsolescence of computers. Ingenuity must be applied to producing computers that avoid the gross wastefulness seen in the industry to date. A distinction must be made between design for recycling and design for long-life. While it is clear that the rapid advances of technology have dictated much wastefulness and obsolescence, it is also clear that electronics and software engineers could provide us with more flexible software and hardware systems that are capable of being up-graded and compatible through time. In that way, only small component parts of a computer would need to be replaced rather than the whole machine. For example, when technological advances create faster processors, it should be made easier to insert the new ones in place of the older ones rather than throwing out the whole computer or motherboard. Many companies have the technological and financial resources to implement such changes; they often lack the political will. As more profit is likely to be made by forcing consumers to buy unnecessarily and thus waste inordinately, it may be necessary to mandate such design reforms through legislation.

10. ESTABLISHMENT OF ECO-FRIENDLY RECYCLING

When it finally becomes necessary to decommission an electronic device, the device must be designed to ensure clear, safe, and efficient mechanisms for recovering its raw materials. Input materials must be suitable for safe reconstitution and recycling and there must be a pre-identifiable recycling market and mechanism established for the input material. Equipment components must be properly labelled to

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identify plastic and metal types. Warnings must be placed for any possible hazard in dismantling or recycling and the product must be made for rapid and easy dismantling or reduction to a usable form.

7.4. RECOMMENDATIONS TO GOVERNMENT

The regulations with regard to the management of E-waste has to be simplified so that manufacturers, dismantlers, authorized recyclers and other related parties can perform better for effective and timely disposal

1. Government should set up regulatory agencies in each district, which are vested with the responsibility of coordinating and consolidating the functions of the various government authorities regarding hazardous substances.
2. Authorised E-waste recycler must upgrade their processes and make sure they adhere to best quality standards. They must be transparent and accountable for their functioning and have to upgrade their systems
3. Government should bring informal sector in to formal system and give them adequate infrastructure and safety measures for recycling and also increase the accountability of this sector.
4. A certain percentage from the price of all such electronic equipment can be directed towards the recycling budget of the government. The government can direct a small part of budget for training E- waste handlers, for public awareness and other related activities. Government must take responsibility to train and monitor the workers. It is necessary to provide them secured livelihood along with life and health insurance.
5. Governments should be responsible for providing an adequate system of laws, controls and administrative procedures for hazardous waste management. Existing laws concerning E-waste disposal be reviewed and revamped. A comprehensive law that provides E-waste regulation and management and proper disposal of hazardous wastes is required. Such a law should empower the agency to control, supervise and regulate the relevant activities of government departments.
6. Governments should enforce strict regulations against dumping E-Waste in the country by outsiders. Where the laws are flouted, stringent penalties must be

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imposed. In particular, custodial sentences should be preferred to paltry fines, which these outsiders / foreign nationals can pay.

7. Governments must encourage research into the development and standard of hazardous waste management, environmental monitoring and the regulation of hazardous waste-disposal.
8. Governments should enforce strict regulations and heavy fines levied on industries, which do not practice waste prevention and recovery in the production facilities.
9. Governments should encourage and support NGOs and other organizations to involve actively in solving the nation's E-Waste problems.
10. E-waste is still not a known concept for many. Efforts are to be made to create awareness programs on E-waste and its management. Campaign aimed to protecting human health and limiting environmental effects where electronics are being produced, used and discarded.
11. Government should have consultations with the industry and all stakeholders to recognise a range of end of life for all Electronic and electrical products. This classification is essential as consumers in India so that consumers do not need to dispose of products before their actual end of life just because of the rules.
12. Polluter pays principle and extended producer responsibility should be adopted.

7.5. SCOPE FOR FURTHER RESEARCH

Every attempt has been made in this study to analyze and evaluate E-waste and its management. The main focus of the present study was the national and international legal framework on E-waste and its impact on human health and environment and ways to manage E-waste. Though the study was exhaustive, considering the significance of the topic and other constraints faced in the research, the study keeps the doors open for further research.

Some of the future scope of the study includes;

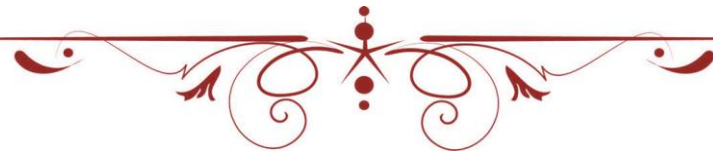
1. There is a scope of detailed study on scientific and technical aspects of E-waste arising from electrical and electronic products.

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2. There is a scope of detailed study on policies, rules, regulations made by each State government with regard to E- waste management.
3. Future study can be on functioning of all E- waste management companies of India.
4. There is a scope of detailed study on scientific and technical methods/ procedures for E- waste disposal.
5. There is a scope of a comparative study of effective E-Waste practices followed by India and other countries.



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