



A Review Study on the Impact of Electronic Waste on the Planet

Dr. Ashish Kumar

Assistant Professor, School of Commerce & Management,
Starex University, Gurugram HR, India, ashishdahiya.775@gmail.com

Rahul Sharma

Research Scholar, School of Commerce & Management,
Starex University, Gurugram HR India. rahulsharmalawyer@gmail.com

Pradeep Kumar

Research Scholar, School of Commerce & Management,
Starex University, Gurugram HR India. pradeepsharmacma@gmail.com

Abstract

E-waste generated by electrical and electronic devices in huge quantities is all over the planet today and has become a worldwide sustainability issue. E-waste is viewed as risky, as specific elements of many electronic and electrical products have substance which is very dangerous to our health as well as the environment. Its lethal substances mixed with soil, water and air caused risky impacts on the entire biodiversity either directly or indirectly. As the world is shrinking continuously ethics and values are also decreasing in this technologically advanced world day by day. No one is giving attention to the e-waste problem.

In the covid-19 situation we have seen that due to the lockdown many people start working at home based and children are taking online classes this leads to more demand for electronic items such as laptops, mobiles, PC, TV, etc. Due to this in long term, we will witness the generation of e-waste is going to be in huge numbers and we will unable to handle it properly, as a result, this will have an adverse effect on human health and the environment. This Review paper is showing present real situation of electronic and electrical waste and its impact in today world.

Keywords: Electronic Waste, Sustainability Issue, Environment and Human Health

1. Assistant Professor, School of Commerce & Management, Starex University, Gurugram HR, India. ashishdahiya.775@gmail.com
2. Research Scholar, School of Commerce & Management, Starex University, Gurugram HR India.

rahulsharmalawyer@gmail.com

3. Research Scholar, School of Commerce & Management, Starex University, Gurugram HR India.
pradeepsharmacma@gmail.com

Introduction:

E-waste is majorly coming from the electronic sector which is harming the environment as well as human health. There is a pattern in which we have seen that there is a huge generation of electronic waste worldwide. This is happening because of technological up-gradation and the latest electronic items coming. Since the last decade, the number of consumers has grown rapidly due to the increase in income of people. This has increased E-waste. We have seen that approx. all countries worldwide are engaged in the recycling of e-waste but millions of tons of e-waste are still there which is yet not been recycled because the speed of recycling of e-waste is slower than the generation of e-waste. The reason behind the huge generation of e-waste is due to our changing lifestyle. We are adopting the new and latest technology to ease living and this is giving us e-waste. EEE items that we have discarded are still there as e-waste and we don't know how to handle it with that equipment. It is assumed that in our country electronic and electrical products e-waste is increasing at 10% per year. Ovement of people from village to city has also playing important role in increase in e-waste in India. Nowadays more and more people are moving towards residing in urban areas. As the population reaches there is an increase in demand for electronic items as a result e-waste also rises to an alarming situation.

Among all manufacturing industries, electronics has the highest growth rate and is the largest in the world. This development in electronic and electrical industry has give problems to humanity. Understanding ethics and values towards the environment have become an important aspect to which proper attention is needed. Advancement in technology leads to a shrinking world. Technology connects people and advancement in technology provides us difficulty in handling e-waste.

Todays tehcnology advance world has provide us new problems in term of e-waste management. The Environmental Protection Agency meanes to e-waste as used electronic products. This definition includes almost all types of Electronic Electrical and Equipment. That has engage in the waste stream. The inappropriate disposal of e-waste items have an affects environmental and human health, as many of these e-waste products carry toxic substances. Electronic waste have includes aluminium, iron, , gold and other metals substances combines over 60% of these electrnic products, while plastics have approximates 30% and hazardous pollutants items have 2.70% (Kurian Joseph, 2007).

Development of Electronic waste from the Electrical and electronic industry has reached its top of the stage. As per the Organization for Economic Cooperation and Development, any electronic product fitted with an electricty power or using electric power that has achieved its life is including in the Waste Electronic and Electrical Equipment Directive (EU, 2002; Sushant et al., 2010). The mainly materials found in electronic and electric waste are non

ferrous material (28%), ferrous material (38%), glass (4%) plastic (19%), and others, including ceramics (11%), rubber, wood, etc. (Sushant et al., 2011).

Management of electronic and electrical waste is the most important ideas for handling the pollution problem World Wide. New Technology is spreading like fire in the forest this leads to millions of appliances that have no use leading to their disposal in prescribed landfill sites and this gives a negative effect on Environment. The Emerge of new technology like the smartness of electronic items, new designs, latest technology, and smart operations in the last 10 years has give direction for using of many waste electronic items. The life cycle of electric and electronic items has been unexpectley shortened approximately 02 years for Tablet, Mobile and Laptop.

Consequently, the e-waste is growing every fast then our imagination from year to year and is also expected to be the of the most dangerous issues of e-waste disposal issues of current as well as future centuries. To be precise for this e-waste issue, the United Nations University has estimated for e-waste that 20 tons to 50 tons of electronic and electrical waste are being generating per year throughout the world (UNEP, 2005) and suggests all stakeholders that urgently requirment for developing and tool for estimation technique for e-waste (UNEP, 2009). As Comparison to tradiional municipal waste, some of the components of electrical and electronic products have containing toxic compounds that have dangerous particulars to human health and same dangerous for environment too. (Woodell, 2008).

For example, computer monitor and television are generally carry dangerous materials such as cadmium, mercury and lead, while zinc, beryllium and nickel easily avilable in circuit boards of electronic products. Presence of these dangerous materials substances, disposal and recycle of the e-waste have developing into important issue to deal with. The physical structure of electronic waste is diverse and have contains over 1000 different type of materials that can be further divided into either inorganic or organic fractions. These heavy metals in form of e-waste form a important part of the man made fraction, contributing approximately 20% to 50%. Electronic waste consists of dangerous items like cadmium, lead, arsenic, mercury, selenium, chromium and some of the costly metals like platinum, silver, gold, and copper. An summery shows that manufacturing of personal computers and mobile phones are using 3% of silver and gold excavate through our the world each year, as well as 15% of cobalt and 13% of palladium. Both dangerous and costly heavy metals are non-sustainable and they have limited avilable resources that will also helping in becoming more costly for general public and value of these metals are going up year to year. Moreover, managing electronic waste is a difficult work due to the various problems in it present situation including strategic, technical, information failures, financial etc. Beside all these, there is an urgent requirment for managing electronic and electrical waste in a systematic, formal, and environmental friendly treatment through recycling these costly and rarely avilable metals from electronic and electrical waste streams.

In developing economies like India, present electronic waste management techniques are used in a unorganized way, which are causing very harmful impacts on our health as well as on environment also. This is the demand of time and for better environment also effective system for recovery, removal should be applicable and developed in proper scientific way, costly and rarely available metals should be preserved, which in a better solution for handling and management of e-waste and for better utilization of these precious metals. (Viraja et al., 2012).

Literature Review

Electronic waste is one of the most challenging waste streams to manage. It has become a significant concern in developing countries due to the ever-increasing volume of generation coupled with deficient growth in collection and processing infrastructure. For the various stakeholders, it is of paramount importance to adopt a robust and sustainable collection method for hazard mitigation. The prevalent e-waste collection methods are categorized under four major heads, namely take-back, retail store, door-to-door and curbside collection. The e-waste collection problems are analyzed from various perspectives, based on literature that cited developing country-specific surveys and data that includes India. Economic sustainability and potential risk are included as attributes in the evaluation scheme. (Shailendar et al., 2022)

Developing countries like India are severely affected by this disposition of E-waste materials in their countries. While private industries contribute to a significant portion of the total E-waste produced in a country, household appliances combined with consumer electronics constitute close to 55.7% of it in India. Private companies and commercial entities have now started to focus on third-party affiliations to dispose and recycle their electronic wastes. With commercial electronic waste management attaining the spotlight, the focus on household and personal electronic goods disposal has taken a backseat. Consumers are not sufficiently educated on how to dispose of electronic goods and this poses a significant problem. Educating electronic users is essential for them to assist the waste segregation process, but most consumers do not want to burden themselves with the extra effort of segregating E-wastes, in addition to biodegradable and non-biodegradable segregations. Hence, household E-wastes usually not processed towards proper methodologies for recycling (Av Shreyas Madhav et al., 2022).

E-waste become most crucial challenge for environment worker and for technolog expert also, as its rate of generating is much high than the rate it is being recycled, disposed of, or used again. It is demand of time that required improvement in all aspects of electronic waste management, rules and policies should be make in today scenerio. Besides above all awareness in people about e-waste is play a major role in handling e-waste managmnet. (Saritha, et al., 2015)

Due to its harmful nature, e-waste is already a major catastrophe and it will continue to create more problems if not handled properly. a most important step would perhaps be raising

awareness among every individual about the cause and effects of e-waste and requesting cooperation in the disposal of the same. (Biswajit Debnatha et al., 2015)

Present legislation needs to be transformed into active policies which will pave way for a brighter pollution-free future in the country. (Ajeet Saoji, 2012)

Management of electronic waste is enabled in non-formal sectors in nation which are developing countries like india and organized in developed countries like USA. In the suggested approach, non-formal sectors are involved in the segregation, disassembly and collection of electronic waste and earning income for their efforts from e-waste. (S. Chatterjee and Krishna Kumar, 2009)

Developing countries, especially in Asia and Africa, are experiencing a major problem with the ever-increasing amount of e-waste, as they lack the policies and infrastructure to deal with the issue in a sustainable way. Although e-waste is a problem because of its hazardous components, it is also a solution to the depletion of the natural resources that manufacturers of EEE depend on. (Sunil Herat and Agamuthu Pariatamby, 2012)

Biohydrometallurgical techniques allow metal cycling by processes similar to natural biogeochemical cycles. Using biological techniques, the recovery efficiency can be increased whereas thermal or physic-chemical methods alone are less successful, as shown in copper and gold mining where low-grade ores are biologically treated to obtain metal values, which are not accessible by conventional treatments. Biodegradation treatment is a better technique for present e-waste handling practices. (Sharma Pramila, et al., 2012)

Proper management of WEEE is a concern that has been recognized by both government agencies and the general public. To accelerate the rate at which proper processing and management methods are employed, timely regulatory and legislative policies and procedures are needed. EU legislation is anticipated that will require cost-effective and environmentally sound WEEE recycling technologies for the electronics industry along with greener product design and production concepts. These requirements must be addressed in a proactive manner (Balakrishnan Ramesh Babu, Anand Kuber Parande, Chiya Ahmed Basha, 2007).

E-waste is a treasure of valuable materials when it is recovered. Hence, proper methods of disposal should be initiated to assure that it does not affect the environment or cause health hazards to the people. (Sabah M. Abdelbasir et al., 2018)

An instant worldwide multilateral agreement is required for addressing electronic waste transportation, recycling, handling, storage, and in last disposal of any remaining waste, whether by filling in land or burning. As it is a global challenge from the transportation perspectives, pollutant production and international negotiation, as well as association, is the original and last way to achieve fesiabile development goals. Formal continuous inventory

actions are needed in unprotected countries such as which are developing countries in worldwide. In addition to these options there is a need to frame health benefits strategies which have focus on e-waste by addressing specific groups, i.e., pregnant women, children, and socio-economically weaker communities. (Md. Sahadat Hossain, et al., 2015)

There is an urgent need to decide on a strategy for the E-waste problem in developing countries like India. UNEP (2010) report predicts that by 2020, E-waste from old computers in India will increase by 500%; from discarded mobile phones will be about 18 times high; from televisions will be 1.5 to 2 times higher; from discarded refrigerators will double or triple, than its respective 2007 levels. Considering the development rate, many studies showing the number of Electronic waste will reach approximately 2 million MT by 2025. (Anwasha Borthakur and Kunal Sinha 2013)

Educating people about how to recycle reuse, and dispose of electronics at all levels will teach them and their communities how to behave more responsibly towards the environment. Indeed, electronic waste is a global problem requiring a global solution. (M. Khurram et al., 2011)

Research Objectives:

- To Study the present scenario of electronic waste.
- To study the Impact of electronic waste worldwide.

Research Methodology

This research paper includes secondary data studies, to find out the objectives of the study. Researchers collect the data from previous studies done by various authors at the national & international levels and also collect data from government websites, journals, magazines, newspapers, and many more sources of secondary data.

Conclusion

Based on various studies it is clear that the part of people who live in villages or cities is very important in e-waste management practices. It is the duty of people concerned about environmental protection and the availability of resources are important for e-waste management practices. It is also important that governments, academicians, e-waste entrepreneurs, and Researchers must have to give proper attention to the e-waste problem so e-waste management practices to be done preciously and properly in a scientific way without harming the environment.

From the various studies, it is concluded that in the present world technology is going advanced day by day but the world is shrinking. We use electronic and electric items. If we can get success in understanding ethics and values towards e-waste handling it is a win

against the war on e-waste. We have seen that those who use electronic and electrical equipment don't know how to handle this equipment when they are dead. Either they throw it in an open area or give it to Kabadiawala (Scrap Dealer). Problems due to e-waste are going to be serious worldwide. When we replace our mobile or computer, that computer or Mobile stays in the environment. So there is a requirement for Research and development so that we can improve the Reuse and Recycling of Products.

There is a need for proper Laws and guidelines that can help in the management of e-waste. The present study showed that Environmentalists and technologists are going to struggle with e-waste in this shrinking world as its rate of growth and disposal rate is very higher of e-waste and recycling process is not as much higher as e-waste. It is demand of time and for the benefits of environment as well as human health that urgent attention in all aspects of e-waste management rules, e-waste management regulation, e-waste management policies, laws related to e-waste is required. For reduction of e-waste and management of e-waste consumer education regarding e-waste is very crucial but not the electronic items manufacturing companies not the government taking consumers education seriously. But Now we have seen that many Electronic and Electrical Manufacturing companies are also giving attention to e-waste management. Many companies have introduced buyback or exchange of product schemes when we buy a new product. The idea behind this scheme is to properly use old products using the Reuse and Recycling Technique.

If electronic waste is not handled properly it will become a serious challenge for all of us. From the Government side also there is a requirement for some serious and strict laws as soon as possible. This work needs the cooperation of corporates, the General Public, and NGOs, the General Public. There is also a need to educate the general public about this critical issue.

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