

E-WASTE MANAGEMENT & ITS EFFECTS ON HUMANS AND ENVIRONMENT

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ABSTRACT

Electronic waste commonly known as e-waste is the waste electronic product that is of no use, ended with its useful life and treated as garbage. Any discarded product such as cell phone, computer parts, battery etc comes under the category of the e-waste. In the current technological era when technology has overcome and captured everything starting from household chores to communication and transport systems it has become a major issue to recycle and reuse of the e-waste. Many companies and authorities have been coming forward to handle these serious issues. Electronic waste may be taken care of by various means such as donating the outdated but still valuable product to someone who is in need of it or reuse and recycle it. Still the e-waste has become a threat to the environment. It can potentially cause harm and effect to human health, animals, water bodies and global environment if not dispose off properly. The improper dispose off e-waste leads to warming up of these products due to which harmful chemicals are released into air damaging the environment. Here in this paper, the effects of e-waste by different ways are shared.

Keywords: e-waste, recycle, reuse, environment

INTRODUCTION

A set of questions come in mind when we think of use of latest technology electronics appliances and outdated electronics systems. Do you use VCR to watch movies, the answer is No for sure. Do you change your mobile model after one or two years on regular basis? Where all the outdated electronic appliances and gadgets go. All this is called electronic waste which is most commonly known as e-waste. E-waste is usually defined as any electronic product or product containing electronic components that has ended with its usable life cycle. As per the report of World Health Organization (WHO) e-waste is the fastest growing waste in the world. The reason is as electronic industry is world's largest and fastest growing industry [1]. Technology is daily transforming to make the human life lavish and comfortable which leads to increase the demand and consumption of electronic equipments and devices. This demand and consumption of new gadgets is creating huge segment of electronic waste on the mother earth. According to the statistics provided by statista, till 2025 the projected strength of mobile phone users in 7.49 Billions [2], which is a 74.9 percent of the project world population in this year. One can have the idea of the e-waste going to be accumulated in coming years due to mobile phones only. Many other electronic wastes such as home appliances, industry instruments, computer monitors, laptops etc are in the separate lobby of the e-waste. All these become e-waste or trash when are of no further use. If such waste will go on increasing day by day, it may be hazardous to human health and environment. It affects the physical as well as emotional health of human beings directly or indirectly. The reason for the various health threats is lack of management skills of e-waste. Due to lack of reusability the e-waste is increasing day by day, if it continues the same way, the problem of e-waste handling may become a major issue to handle. This paper basically covers the different e-waste sources and effect of e-waste on the

environment.

E-WASTE SOURCES

Due to the ever changing demand of the electronic goods such as mobile phone, solar cells, household appliances, electric vehicles the e-waste is increasing globally day by day. As the technology changes, the public and private sectors are replacing the old electronic products by the new one. All this is increasing e-waste garbage, although the household e-waste is less as compared to the generation of mobile, computer, still it is becoming a major issue to handle the waste and garbage.

E-WASTE PRODUCED IN INDIA & GLOBALLY

As per the report of statista “In the financial year 2022, more than 1.6 million metric tons of e-waste was generated in India. The volume was more than double in comparison with 2018. During 2022, India had collectively collected and processed 527 thousand metric tons of e-waste” [3]. According to the report of United Nation Institute for Training and Research (UNITAR) about 62 million tons of electronic garbage is generated in Year 2022[4], which is expected to increase by 33% till 2030. This speed of increasing the electronic waste is a serious issue to control and manage. E-waste in any form contain toxic and hazardous product that are harmful to both human beings and environment. As per UNITAR if countries make efforts to e-waste collection and recycling rates to 60% by 2030, this may minimize the human health risks and will also improve the environment health.

VARIOUS EFFECTS OF E-WASTE

There are various harmful effects that are faced by both humans and environment due to the mismanagement and improper handling of e-waste. In the following section various effects of e-waste have been described.

E-waste carries various hazardous toxic elements such as Arsenic, lithium, cadmium and many more. A lot of study has been conducted regarding the exposure to chemicals and various harmful heavy metals that are exposed from the e-waste all over the world. This impact is overwhelming on human health, particularly for the societies living near the e-waste recycling sites which are more prone to inhalation of toxics and radiations eliminated from the ewaste [5-6]. There are numerous effects of e-waste on human health as described in Table-1.

HAZARDOUS COMPONENT	PRESENT IN	CONSEQUENCES DUE TO PRESENCE OF HAZARDOUS ELEMENT
Lithium	Present in Batteries, photographic equipments	Long-term exposure to lithium vapors can cause vomiting, nausea, disorientation, and muscular weakness
Arsenic	Semiconductors, diodes, LEDs, microwaves and solar cells	Affects the nervous system and the skin Long-term exposure can cause lung cancer.
Mercury	Copper machines , Batteries, flat screen monitors and switches,	Affects the central nervous system, kidneys and immunological system and Cause skin issues.
BFR	Circuit boards, Different Casing and chips	Affects reproductive and immune systems, Hormone imbalances and endocrine system issues are possible side effects.
Dioxins	different type of cables and from metal smelting	Increase cancer risk
Lead	thermoelectric elements, thermocouples, and Thermistors	Affects kidneys, reproductive systems, blood and brain illness.

Table-1: Effects of e-waste on human health

The most significant effect is associated with the release of hazardous chemicals such as lead, cadmium, mercury etc. If the e-waste is not managed properly they are in the contact of human beings directly or indirectly which may lead to various problems such as damage of nervous system, kidney failure, cancer etc. The e-waste may also harm the workers who are involved in the recycling process if they are not using protective equipment while dismantling and managing the e-waste. Hence it is necessary to take precautionary equipments and protective masks during the process of exposure to e-waste. The improper disposal of e-waste releases toxic elements into air as well. When people inhale these pollutants this may lead to respiratory problems. Sometimes improper management of e-waste comes in contact with the ground water which may contaminate the water and lead to severe health problems. Thus improper disposal of e-waste results in pollution of air, soil and water bodies which pose risks to water bodies, human beings and animals as well. The e-waste also contributes to climate change through emission of green houses and ultimately has bad impact of the atmosphere.

CONCLUSION

The negative effect of e-waste on human health and environment is a major issue that requires keen concentration and action. The proper recycling and management techniques such as implementation of proper regulations, contacting the registered organizations for the disposal of e-waste may help in reducing the risks of bad impacts on human, animals, water bodies and environment.

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