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E-Waste Management: Impact On Environment and Health

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Introduction

India is among the fastest growing economies in the world and stands among the top domestic consumers of electronic goods. According to an executive summary issued by India Brand Equity Foundation (IBEF) in the year 2020, the electronics market is expected to increase with a CAGR of 24.4 percent. From 1995 to 2015, around 70 percent hike is observed in the sales of domestic electronic appliances, instruments and goods. As the demand for electronic goods is rising rapidly so is the electronic waste generated from the obsolete and unused gadgets.

Treatment, the process of discarding and the recycling procedures of such waste has now become a big challenge for the country. As e-waste though got the limelight of media but is facing criticisms due to its effects on the environment and its creatures.

Process of discarding waste is thoroughly explained in environmental laws. However, e-waste (which is electronic waste) is not so common term and hence its meaning, effects and management is not known to the wider part of population. Since the awareness about the topic is not widespread, the waste is totally managed by unorganised sector. If not handled properly, such electronic waste can cause serious health ailments to the public. In a developing country like India where every day a new electronic device is launched, recycling or disposal of electronic chemicals is a challenge in India. Globally, many countries are struggling to find a

suitable way in order to deal with such chemicals, this sector is growing at a very pace due to its unawareness.

Half of the population stores electronic devices and equipment at their store houses as they never got to know how to discard them to discarding them in a particular way could be vulnerable.

Such waste chemicals contains metals like gold, silver, copper which could be effectively utilised in the production process. On one hand, life is becoming easier and comfortable whereas on the other these devices are actually deteriorating the resources.

Meaning

E-waste in common parlance can be understood as the waste generated from electronic items such as gadgets, tablets, laptops, mobile phones, computers, TV appliances, stereos, fax machines in form of harmful chemicals like mercury, lead, cadmium, retardants, brominated flame etc. E-waste comprises of those electronic devices which have become obsolete or not in working condition or have become unwanted due to the passage of time.

Since 1990 to 2020, electronic industry has gone through a massive change and so as the method of disposing the waste of electronics. Unlike past, environmentalists today are more aware and active with respect to any act in contravention with environmental law. “Digital rubbish” is another term which was previously adopted to describe those electronic goods which are near or at the end of their useful lives and is treated as electronic waste. Generally, the electronic waste includes broken parts which have stopped working or are kept idle due to its failure to work or when their disposal is not known to its user.

The reason behind why the issue of disposal and waste is gaining so much popularity is the presence of toxic chemicals and substances that are present in metals of discarded electronic goods. Some of the common electronic items of domestic use are microwave, electric cookers, heaters, fans. Unknowingly, we dispose these goods in wrong ways or just leave them idle on roads which is another big problem.

The electronic goods which form part of communication and information technology industry are mobile phones, laptops, hard drives, smart tablets, computers, video players, smart and night lights, medical equipment, Wi-Fi dongles. Not all devices of e-waste are a result of obsolescence some are abandoned due to switching to new technologies. Due to the presence of chemicals these electronic items cannot be buried. As traces and emissions of the buried and burnt items could lead to a threat to the nature, environment, water, wild creatures, soil and air. The traces could even pollute the groundwater and water bodies which could make the survival of aquatic life vulnerable.



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The only solution is recycling of e-waste. Recycling can aid to both industrial growth and human and environmental health. The materials like plastic, glass and metals can be used in the production of other goods and can generate value for the industries. These obsolete goods aren't actually obsolete. All that is required is the treatment of Junk in such a way that they can aid in production with minimum loss to human bodies and environment.

Environmental Effects

Obsolete electronic devices and electrical appliances contains about 30 percent plastic, 60 Percent metals including aluminium, copper, iron and a small percentage (which is about 3 percent) of hazardous substances which can cause vulnerable health threats. According to research, lead is most widely used in electronic appliances, instruments, medical equipment's and is been considered as very dangerous and toxic pollutant which is responsible for causing serious contamination in environmental health.

Lead is a most poisonous substance and can enter into a human body through inhaling, water, food etc. The list of such toxic chemicals includes beryllium, cadmium etc. Children are particularly considered as more vulnerable to lead poisoning as compared to adults. Once entered into the body, these chemicals majorly affects the nervous system and blood.

Recycling procedures plays a very important role in safeguarding interest of the workers. If right process of discarding is not adopted, such harmful substances can enter the bodies of workers by way of dust, soil, ground water, river etc. The common reported side effects from such toxic substances vertigo, nausea, skin and eye damage, headaches, chronic gastritis and gastric and duodenal ulcers.

China tops among the worst affected countries. Large number of people including children in India and China are exposed to heavy toxins present in metal including polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans as the result of dismantling activities of e-waste. This is an alarming situation for India to treat the waste in an organised and planned manner with appropriate knowledge.

Health effects

The e-waste management systems must be researched and studied well to control its hazardous effects on health and safety of the workers working in the discarding and dismantling processes.

Growth and environmental benefits must go parallel and not one at the cost of other. Safer substitutes must be adopted and restrictions must be imposed as levied by ROHS (restrictions of hazardous substances). The workforce consists of the poor people and rag pickers who put their lives at risks to earn. Every year the lists of e-waste goods gets longer with no proper disposal of the accumulated appliances of the past years and in this way condition gets worse. World Health Organisation (WHO) also considered this as a serious issue which requires attention. Inhaling toxic fumes like cadmium, brominated flame retardants, lead can cause respiratory diseases and inhalation ailments. The environment and health saving strategies can only be implemented at first place by the companies or manufactures of goods or the companies solely dealings in treatment of electronic goods recycling process. Presently, many companies are coming with the policies to buy back their products to ensure safe disposal of the electronics purchased by them. Consumers' manuals must be prepared in such a way with clear instructions about the disposal process.

Present Scenario

So few recycling methods and strategies have been explored till date and this is the reason that India depends on unorganised sector for treatment of such waste. Moreover, the recycling activities are performed and processed by amateurs, mostly undertaken by the poor people of slums who lacks training, proper information and knowledge about the contamination of substances and their detrimental effects on body and the environment as well. Poor workers with

a sole objective to earn money expose great risks to their health and get as low as 5 to 10 bucks for dismantling a single set of computer. Lack of proper training facilities and protection equipment is another considerable reason for such negligence. Despite so many legislations on workers and labour welfare, the condition is worsening due to lack of awareness of the harmful effects of disposal of e-waste. E-waste also results in theft of confidential data. This usually happens in corporate during amalgamation or winding up of businesses when they discard old electronic goods.

Legislations

Though no specific and separate legislation has come so far to treat the waste generated from obsolete and electrical devices or instruments, The Environment Protection Act, 1986 is an initiative to protect the environment from harmful substances of industries including e-waste. The principles of absolute liability and "polluter pays principles" (also known as extended producer responsibility) are some principles which imposes a liability on the polluter of environment that he will be held responsible for the damage caused by him to the environment and hence discourage negligence on their part.

Public international law is another legislation which deals with the matters related to sustainable development and environmental protection. Rio declaration and earth summit are some among the examples. Central and state governments are empowered to act and enact laws as and when required for the protection and safeguard of environment from the effects of chemicals. Any acts which are in contravention of law are liable to be punished.

The ministry of environment and forest is another organisation which is keeping a track on rules framed to treat electronic waste. In 2007, guidelines were formed to treat hazardous chemicals

coming out from e-waste, their management and municipal solid waste management rules are given by CPCB. To sort the issue, the responsibility of proper and safe disposal is on the shoulders of manufacturers of electronic equipment of computers, gadgets, music system, laptops, mobile phones etc. Department of Information technology also contributed by way of comprehensive guidelines and methods to deal with such waste.

Renowned companies like Apple, Dell, HP and Nokia duly work on their recycling schemes, campaigns and electronic waste management programs as a part of their policies to adopt safeguards for environment.

Proper Management is a boon

E-waste handling industry is gaining so much popularity due to the undiscovered opportunities associated with it. The recycling alliances could generate employment to many groups of people. Increase in demand for electronic goods is a positive indication of growth only when it is compatible with the environment. E-waste industry has been underrated and has numerous unutilised opportunities. Since most of the developed countries like china are struggling to find policies for management of e-waste and resultantly suffering due to its negative impacts. India can get the first mover advantage by finding ways to treat the chemicals in eco-friendly manner. Making proper strategies can attract investments and in turn contribute to the development process of the country. Such investment could be utilised for research and development purposes. According to government reports and estimates, the division of goods in the total production is such that highest share of total production is taken by broadcasting equipment, industrial electronics. Computers also form a considerable part in the total production of electronic goods.

Consequences of improper dismantling

More than eight lakh tonnes of e-waste is generated every year which is treated and processed by the workers including children with their bare hands exposing them to the risks. The electronic manufacturing industries have huge capacity to generate employment, more than 25000 workers were employed last year to treat such chemicals in Delhi and most of them were rag pickers, they were employed to treat e-waste without proper knowledge about dismantling and disposal. The electronic industry requires central and state governments focus and attention as it could be a boon, if due attention is given, norms are made and e-waste treatment is managed properly by employing the right workforce, on the other hand, it could be a threat to public health and safety. Additionally, improper dismantling could cause adverse effects to the ecosystem. Awareness programmes can choose the medium of movies to explain the hazards of wrong disposal of electronics. The Bollywood movie “Robot” can act as a wonderful illustration while explaining the threats caused by negligence.

If we weigh the e-waste management process now, it is surprising to know that only 3 percent of the total e-waste generated is being treated properly. The major reason behind this is that many countries are exploiting India's resources and leave behind tonnes of obsolete, unused and broken parts of electronic goods which increases the burden of the country in treating such electronic waste.

According to a report prepared by Basel action network (BAN) about 70 percent of electronic waste generated by U.S.A is exported to other countries and India is listed at the top of the list, Pakistan, Saudi Arabia and China are some others.

Conclusion

Due to lack of awareness and proper measures, the industry of e-waste is in critical condition as they are no benchmarks and proper standards to regulate the activities related to different appliances. Classification of electronics is a prerequisite before deciding on their disposal mechanism. On the other hand, there is no scepticism that it is one of the fastest growing sector with numerous opportunities encapsulated in it. As the e-waste industry employs large number of workers including children, livelihood and health risk exposed to workers must be reduced and protection equipment's, training and recycling procedures must be simplified to make them understand and save the workers from deprivation of the right to life and personal liberty. Rules must be formed on Personal protection and safe handling of the electronic waste. New technologies, technical solutions, methods and procedures of recycling must be explored to reduce the health and environmental risks. Also, training tutorials for the workforce must be encouraged. Existing legislations must be applied and new legislation must be formed to promote management and research in the fields of electronic waste. While adopting new recycling schemes, provisions for proper incentive schemes must be taken care of. E-waste accumulation by way of foreign country exports must be checked and dealt.

Thanks for Reading!
