Awareness of Reuse Reduce Recycle & Dispose of E-Waste in Chennai

R Ganesan*, B Ramesh, and Charan Teja
Department of Civil Engineering, Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India
Email: *grganeshr4@gmail.com

Abstract. In this survey, I came to know that the development of area or city leads to the growth of E-waste, but the percentage of the public who are aware of E-waste is not growing up to the mark. The technical solutions, segregation process, preventive methods, skilled labors working on E-waste, modern technology adopted for disposal are very less in growing cities when compare to the metropolitan cities. I came to know about the urgency of creating awareness to every person using electronic gadgets about E-waste and its ill-effects on the human race. Segregation of metals and components while disposing of the E-waste also causes ill effects for the workers involved in that, as facilities like gloves, caps, masks are not available in poor countries. Dumping of E-waste into seas or in barren islands leads to water pollution, affecting aquatic and marine life. As most of Chennai is a coastal area, many small and medium industries and household E-wastes are releasing into the seas easily. The survey conducted in Chennai city reveals the immediate reaction to the proper disposal of E-waste.

Keywords: E-waste, recycling of wastes, reuse, electronic waste management, E-waste survey.

1. Introduction

Chennai is the third largest cosmopolitan city in India. The infrastructural growth of Chennai results in the growth of IT industrial sectors like textiles, automobiles, information technology, etc. Chennai became a hub for the IT industry. The city's development in various sectors leads to the significant growth of population technology and prosperity of the people. Life is unimaginable without electronic gadgets like laptops, LED Bulbs, accessories, display units, servers, air conditioners, printers, scanners, Xerox machines, refrigerators, Tele-communicative devices like cellular phones, fax machines, etc. DVD'S, CD'S, censors fire alarms, microwave ovens, washing machines, etc., in each and every class of peoples in every sector. These gadgets obsolete in a short time due to less efficiency and with changing technology become waste. Thus, it is termed electronic waste. Several hospital wastes also have a dangerous waste to the environment [15].

1.1 The volume of E-waste is increasing exponentially due to various reasons.
1. No proper technology is available to facilitate the proper disposal of E-waste.
2. Awareness to reduce E-waste [5] is very low among households, employees, youngsters, and every class of people.
3. The public usually is not shown awareness for the hazardous E-waste to the human race and the biosphere.
4. The heavy dependency of electronic gadgets on every day walk of life.
5. Flexibility, accessibility, and availability of Tele-communicative devices like mobile phones, headphones, tablets, PCs, I-pods, and I-pads.
6. For a few decades, the increasing populations of India abruptly lead to overpopulation in the over-optimizing leading to e-waste.
7. For disposing of wastes, there is a lack of facilities. The usage of traditional techniques is not sufficient for waste disposal as the components present in the gadgets cannot be disposed of in the same manner.
8. In accordance with various government organizations like Chennai pollution control board (CPCB), Department of IT technologies (DIT), center for science and environment, Integrated pollution prevention and control (IPCC) have laid prescribe rules to dispose of E-waste. But, unawareness of these rules in each and every sector generates E-waste and its ill effects.

2. Effects of E-Waste on the Environment
The disposal methods of E-waste create difficulty for mankind. The chemical components and the metals in E-waste need different methods of discarding. Several chemicals like mercury, lead, chromium. Polyvinyl phthalates and chlorides are more hazardous to the atmosphere, and contaminants are spread into the air through the dust, which leads to air-borne diseases and Global warming.

Incineration of E-waste also emits toxic [9] gases and fumes, resulting in air pollution by which mankind will suffer in inhalation, ingestion, and skin problems. Most of the developed and developing nations dispose of E-waste by land filling. Due to lack of facilities, the progressive increase in E-waste will spoil the soil fertility that is used for agriculture. The remains like acids and sludge obtained from the improper burning and melting of E-waste will lead to soil acidification.

Segregation of metals and components while disposing of the E-waste also causes ill effects for the workers who are involved in that, as facilities like gloves, caps, masks are not available in poor countries. Dumping of E-waste into seas or in barren islands leads to water pollution, and it affects aquatic and marine life. As most of Chennai is a coastal area, many small and medium industries and household E-wastes are releasing into the seas easily. The survey conducted in Chennai city reveals the immediate reaction to the proper disposal of E-waste.

3. Objective of Study
My objective of the study is to create awareness on E-waste for each and every individual who cares for society. Encouraging each individual to know about RRRRR (Refuse, Reduce, Reusable, Repurposing, Recycling) policy. My survey reveals the most repetitive electronic gadgets used by individuals concern of Governments towards awareness programs to dispose of E-waste. To know about the take-off, E-waste is created by each section of people in the society. To know about the percentage of people who are willing to converse nature in its pristine form. To educate each and every class of people about the ill effects, it caused by E-waste. To know the urgent requirement of modern technology, it is to dispose of E-waste. To know the purpose of usage of electronic gadgets, it is used by every class of people. Creating awareness to all sections of the people about the money they are spending towards electronic gadgets and the alternatives which are possible to adapt at a cheaper price. Mainly, my survey observations’ central idea is regarding the existing awareness of the public towards electronic waste and how to refuse the gadgets, reduce the usage, reuse the existing ones, the repose of gadgets to multi-purposing, how the E-waste is recycled and disposed of. This section of people and creating more E-waste and regulating the E-waste in their section is the main idea of my survey. How people's economic status is subjected to E-waste and which class of electronic gadgets is enormously creating E-waste is the main theme of my survey.
4. Literature Review

4.1 Scenario of E-Waste in Nagpur City-A Case Study
In this survey [1] came to know that the development of area or city has a growth of E-waste, but the percentage of the public who are aware of E-waste is not growing up to the mark. The technical solutions, segregation process, preventive methods, skilled labors working on E-waste, modern technology adopted for disposal are very less in growing cities when compare to the metropolitan cities. I came to know about the urgency of creating awareness to each and every person using electronic gadgets about E-waste and its ill-effects on the human race.

4.2 Impacts on E-Waste Management
From this article [2], I came to know about the environmental impact which E-wastes create. Each small appliance, including lights, fans, LED bulbs, and switchboards, also plays a vital role in creating E-waste. The constituents of electronic gadgets like lead, cadmium, mercury, plastics, barium are polluting the earth, air, and water. Each and every developed cities are also producing E-wastes substantially.

4.3 E-Waste Management-A Survey
From this survey [3] [4] came to know and felt very much bad about the methods of disposal of E-waste followed by developed nations. In spite of usage of modern technology in disposing of E-waste they are dumping most of the E-waste in under-developing nations who are not much developed in modern techniques of disposal. The Government should embed the compulsory law towards the disposal and ill effects causing by E-waste. From this survey, the Government, commercial agencies, and the industrial sector should be aware and create awareness to society about E-waste and its ill effects.

5. Methods for Disposal of E-Waste In India- A Survey
The central idea of this survey is about the accumulation of E-waste from the business sector and households. The survey is giving hope to make India a better place without E-waste by adapting modern methods in recycling and encouraging eco-friendly products. The methods suggested in this survey are more user-friendly to the human race as well as the environment. Mostly this survey stressed the methods of reducing E-waste by recovery, reuse, and recycle. The methods suggested in this survey should be considered and implemented by the Government and the industrial sectors.

Some survey reveals the percentage of E-waste produced in in highly developed city like Beijing in China. Most of the technical updates of electronic gadgets in households as well as industrial sectors and in the information technology sector are increasing to adopt increase of E-waste. The efficiency of gadgets will increase the life span of the gadget, which leads to reduction of E-waste. An over-populated city like Beijing should adapt the mechanical methods in spite of electronic gadgets for each and every tiny work. So dependency on electronic gadgets can be reduced drastically [13].

5.1 Household Waste Management
Small actions can lead to a significant change in society. From this survey, creating awareness and change in school students’ attitudes towards waste management can lead to a significant change in the environment. The schools should regard waste management as a co-curricular activity for students. Younger generations are the only hope to follow the RRR (Reduce, Reuse, Recycle) policy. The implementation of waste management in each and everybody’s life can help to form a better society.

5.2 Disposal and Its Impacts of E-Waste On The Environment
This survey reveals the impacts of E-waste on the environment. It warns the human race about the dire consequences that are awaiting our biosphere. E-waste impacts the environment, whether landfiling or incineration, will lead to the Greenhouse effect. The effect of E-waste on humans is highly considered as it is the main cause for dreadful diseases like cancers, intestinal, respiratory and skin. Some safe methods of the handling of components the existing of E-waste will be reduced.
5.3 E-Waste Recycling Comparison

[11] The most technologically advanced country like Switzerland cannot be compared with overpopulated, underdeveloped countries like India. India can adapt the methods of waste management followed by Switzerland. But economically, technically, climatically, it may not give the desired results. The generation of waste mainly depends on the usage. Population, the lifespan of electronic gadgets cannot be compared with Switzerland’s waste, which is very less in numbers. But, we can get help from E-waste management advisors in Switzerland to prescribe the new methods that India can afford to meet our needs.

5.4 E-Waste Management in India: Current Practices and Challenges

This survey reveals the current situation of E-waste in India [12]. The current practices and challenges faced by the Indian Government to reduce and recycle E-waste are openly given an idea to the public. This survey gives a clear idea for each and every individual, towards the urgent need of awareness on E-waste, to safeguard our nation India. The guidelines suggested by the survey to dismantle E-waste are very effective and highly applicable. The idea of collection and storage of E-waste is more impressive to the metropolitan cities in India [6]. Collection centers of E-waste should be set up in each and every corner of developing cities.

5.5 E-Waste: Environmental Problems and Current Management

The E-waste management became inexorable not only to the under developing countries but also to the developed nations like Japan, Greece, Switzerland etc. By this survey, I came to know the Government of developed nations is very particular about the scientific methods to dispose of E-waste. The life span and efficiency of the electronic gadgets in developed nations are more when compared to the under developing nations. But the household E-waste, like electronic devices in kitchens, E-toys, lightening equipment, automatic dispenses, and other electronic gadgets, can be controlled by those nations [7].

6. Resources Recovery and Waste Management

The developed country like France set-forth as an example for all the other countries who are suffering from the management of E-waste. Re-usage of metals like copper, Aluminum, plastic, silver, glass, etc. metals are gained from E-waste can be collected and used again. In this way, usage of metals and disposal can be reduced and become easy. The mining can also be controlled, as well as the resources can be restored for future generations. The growth of E-waste will be sustained by following reusage and recycled methods. As a developed country with advanced technology, minimum labor, following right procedures, allocation of funds, they can minimize E-waste.

6.1 Investigation E-Waste Generation in Chennai City

Waste management, due to technology development in India, mainly computer development and computer wastes occur. Several manufactures have recycling and reuse that E-waste. In modern India, we have several technologies to develop the reuse of E-waste. Mainly E-waste is more harmful to the environment, so the recycling of those wastes is necessary. The workers who are involved in the collection of waste are basically poor. The Government bodies should also take necessary actions regarding these issues.

6.2 Impact of E-Waste Handling System Statics in Chennai

The local agencies will exchange the E-waste for another product with the dealer, and the user will exchange the E-waste primarily through the local agencies, and they also follow the buyer return option. This is also a good approach to sustain development in handling E-waste in the future. As per the result, the number of people who are unaware of E-waste is significantly high. An effective recommendation by the professionals of waste management and handling is restructuring the framework of policies and organization of recycling.
6.3 Electronic Waste: A Case Study
In daily life, electronic products are increases; the usage also increases gradually. In India, we import most of the waste from the US. Our authority just imports the waste and creates a harmful environment. An effective recommendation by the professionals of waste management and handling is restructuring the framework of recycling policies and organization. Only 3% of total WEEE (Waste from electrical and Electronic Equipment) is generated and recycled properly in India. The disposal of E-waste in India and several countries are very challenging. The developed country like France set-forth as an example for all the other countries who are suffering from the management of E-waste.

6.4 E-Waste Management - An Overview in India
The development of industry played an important role in the country's economy and people's growth. So, toxic wastes are increasing day by day, and it is essential to take precautions on toxic wastes. At recycling of wastes, some unwanted products also developed and it creates harmful situations. The removal [8] of E-waste is included different authorities like corporations, state, and central governments, municipalities for urban areas. For rural areas, the panchayat has the authority to remove the E-wastes. As most of Chennai is a coastal area, many small and medium industries and household E-wastes are releasing into the seas easily. The survey conducted in Chennai city reveals the immediate reaction to the proper disposal of E-waste [14].

6.5 India-Chennai E-Waste Handling and Household Management Survey 2016
Most probably, households, employees of the IT industry, and cellular phone usage are the main cause of E-waste. So, creating awareness in those sections can expect better results. As of industrial growth, inventions include E-waste development, control of import and export of E-wastes regulation, control of import and export of E-wastes and facilitation in the development of infrastructure mode of purchase are differed according to their financial status. This is also a helps for the low generation of E-waste. Several programs give the importance of reuse and recycling of E-waste that will reduce the harmless of E-waste [10].

6.6 Electronic Waste and India
E-waste is one of the fastest-growing waste streams in the country. E-waste is growing in India at the rate of 10%. Most of the recycle of wastes occur in hazardous method. If they are stored in some sector, it tends to be hazardous. To improve waste management, proper education is needed and to create awareness on every people in the country about waste management. Every citizen has knowledge of E-waste management and disposal methods. We need technologies like the reuse of metals also the main part, and the safety of workers is also the main part.

6.7 Electronic Waste Management in India-Issues and Strategies
The electronic industry is the world's largest and fastest-growing manufacturing industry. It exists an urgent need for a detailed assessment of the current and future scenario, including quantification, existing disposal practices, environmental impacts, etc. establishment of E-waste collection, exchange and recycling centers should be encouraged in partnership with private entrepreneurs and manufacturers. Model facilities employing environmentally sound technologies and methods for recycling and recovery are to be established.

6.8 A Study Of E-Waste Management On The Subject Of Awareness Of College Students
Increased use of electrical and electronic equipment coupled with a huge population and changing consumption patterns are generating waste in India. These spectacular developments in modern times have undoubtedly enhanced the quality of our lives. Governments must encourage research into the development and standard of hazardous waste disposal. Reuse, in addition to being an environmentally preferable alternative, also benefits society.
7. Conclusion

Incineration of E-waste also emits toxic gases and fumes, resulting in air pollution by which mankind will suffer in inhalation, ingestion, and skin problems. Most of the developed and developing nations dispose of E-waste by land filling. Due to lack of facilities, the progressive increase in E-waste will spoil the fertility of the soil which is used for agriculture. The remains like acids and sludge obtained from the improper burning and melting of E-waste will lead to acidification of soil. Several awareness programs are needed to be conducted in the city about E-waste management. The usage of waste products of private and public sectors will be high, so it needs to get the knowledge on waste management. The main aim of this study is to achieve a country without e-wastes. Suppose a country developed the new or trend technology they need to know the safety things on the technologies. The sector is responsible for the safety of the workers. We need to develop eco-friendly metals; these metals are friendly to the environment. All manufacturers should develop eco-friendly materials. By using studies and programs on waste management, we can achieve the country as a zero E-waste.

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