

## A STUDY ON 'e-WASTE: MAJOR CHALLENGE FOR e-WORLD'

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### ABSTRACT

*Today, world is electronic system based world. The usages of electronic equipment increase day by day. As the uses of its increase it's a problem rise to handle them. As the electric and electronic equipment decrease their value for their users or the original purpose is now not satisfied, its converted as 'Wastages'; this is called E-Wastage. Electronic devices are made by a composite mix of materials that include gold, silver, copper, palladium, lithium, platinum, cobalt and many heavy metals like cadmium, lead, beryllium, mercury, PVC plastic, and hazardous chemicals, such as brominated flame retardants, which can damage human health and the environment. It is not ban by state level although some communities or cities have policies for recycle of it. Unfortunately, India has not well equipped skilled labour to handle e-waste recycling. Approximately 80 per cent workers who collect e-waste in India suffer from respiratory ailment because of no proper standard and nearly 500,000 children are occupied in collection of e-waste without satisfactory protection and safeguards. Since India is highly poor in valuable mineral resources, there is highly need of a well designed, strong and synchronized e-waste recovery administration which can generate jobs as well as wealth also. This paper looks at some of the basic questions, such as defining e-waste, exploring why it is important, how consumers can recycle and what should be the step of state.*

**KEYWORDS:** *Electronic Equipment, Recycling, Mineral Resources, Environment.*

### Introduction

Whenever we talk about pollution we just think water pollution, air pollution, soil pollution ...etc. We find the reason of it is garbage which can be solid or semi solid. Apart of the normal garbage a new waste is also clicked now as a serious issue which is "e-waste of e- world"

The uses of electronic instrument increase day by day like mobile, computers, T.V., refrigerator, micro wave etc. As the uses of its increase it's a problem to handle them. As the electric and electronic equipment decrease their value for their users or the original purpose is now not satisfied, its converted as 'Wastages'; this is called E-Wastage.

Used electronic equipments whenever discarded or consider as end of life are called **e- waste**. Electronic waste product may decrease their utility value through replacement, idleness or breakage.

Following can be as e-wastage:

- TVs, cables, lamps, circuit boards, clocks, flashlight, calculators, phones, digital/video cameras, radios, DVD players, MP3 ,VCRs and CD players
- Kitchen equipment like toasters, microwave ovens, refrigerator , coffee makers ,
- Laboratory equipment like hot plates, calorimeters, microscopes etc.
- computer monitors, printers, keyboards, scanners which are broken, television tubes (CRTs)

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### Objectives

- To analysis the scenario of e waste in India.
- To search the problem which arise from e-waste.
- To study the methods which are available for the management of E-Waste in India
- To provide the suitable suggestions.

### Review of Literature

**S. B Wath. (2010)** provides a thought on E-waste composition, category, Global and Indian E-waste conditions, projection of recoverable, recyclable and process followed for recovery, and their environmental and industrial hazards.

**P. Kiddee (2013)** gives an overview for lethal substances nearby in the E-waste, their environmental and human health impacts with management strategies currently being used in many countries.

**Pinto, 2008** provides a summarizing overview of India's current E-waste scenario, like magnitude of the problem, environmental and health hazards, current disposal and recycling operations, existing legal frame work organizations working on this issue and recommendations for action.

### Methodology

This is descriptive article and based on review of literatures. The data are collected Secondary base by literature survey.

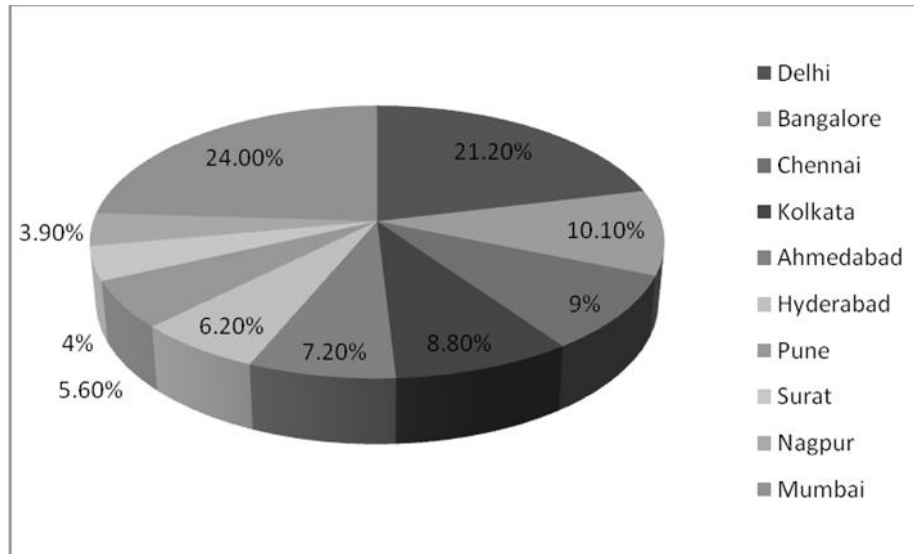
### E-Waste and India

According to the survey of MT in 2016, annual e-wastage in India is 1.85 Million and it is expected that it will reached near 5.2 million in 2020. In all over world around 40 to 50 million tones e-waste generated annually. By the generation of so much quantity (1.85 Million) of wastage India become 5<sup>th</sup> largest country in the world with 4% of total world account. United State ranked first in this criteria by generating 11.7 million tones annually.

Name of Country	E- Waste (Million Tonnes)
USA	11.7
China	6.1
Japan	2.2
Germany	2
India	1.8



In India, if we check the situation state wise Maharashtra generate highest e- waste which is 19.8% of India but it recycles only about 47,810 tons per annum. Other states such as Tamil Nadu generates 13% and recycles about 52,427, Uttar Pradesh generates 10.1% and recycles about 86,130. Conditions of other states are like in West Bengal (9.8%), Delhi (9.5%), Karnataka (8.9%), Gujarat (8.8%) and Madhya Pradesh (7.6). If we check the scenario of Indian cities Mumbai got top rank. It generated estimated 1,20,000 tonnes annually. 60% of total e-waste generated by 65 cities, whereas, 10 states generate 70% of the total e-waste.



If we check the situation sector wise, the government, public and private sectors are the primary source of e-waste and contribute 70% of total e-waste. Individual households contribute only 15 % and remaining 15 % is generate by manufacturers.

#### Problems from E-Waste

If e-waste is processed scientifically, many precious metals like copper, silver, gold and platinum could be recovered from it. However, many substances like liquid crystal, mercury, lithium, nickel, PCBs, chrome, cadmium, cobalt, barium, copper and lead, which are an inherent part of electronic equipment, create problems.

If e-waste is dismantled and processed in an unsophisticated manner, its toxic constituent can do damage on the human body.

In computer monitors cathode ray tubes are used, have heavy metals like lead, barium and cadmium. If they are not proceeding in proper format it creates adverse impact on the respiratory systems and human nervous system.

India has not proper methods for recycling of ill equipped waste. E- Waste collectors have not proper helmets and gloves. They haven't proper knowledge of dumping or dismantling of waste.

Another problem is that e-waste can't be look at par with solid or liquid waste.

In the same way, in the printed circuit boards lead and cadmium is present, in the motherboards there is beryllium, mercury in flat-screen monitors and switches, in the computer batteries there is cadmium, PVC in the cable insulation and bromine in plastic housing is a reason of damage to the human body parts basically in nervous system, kidney and liver, lungs and skin, heart, lever and muscles, brain, kidney and liver, immune system and endocrine system respectively.

In all over the world total \$64.6 billion e – waste are consider as recoverable material , but only 20 percent of it is properly recycled and convert it as valuable material. Most of material is dumped in landfills where toxic chemicals can leak from the e-waste and end up contaminate the water supply.

So e-waste equally harmful for the environment and human body.

#### Current Status of E-waste Management in India

According to CPCB, there are 214 authorized recyclers in India.

However Certain changes are gradually taking in the e-waste recycling. Two non-profit organizations have collaborated with post offices and Bangalore. From this one organization is setting up e-waste collection units at their premises.

**Saahas**, an NGO has also started an awareness program across colleges, schools, hospitals and nearby offices for door-to-door e-waste collection they educate people about the problems of e-waste and its recycling dealings.

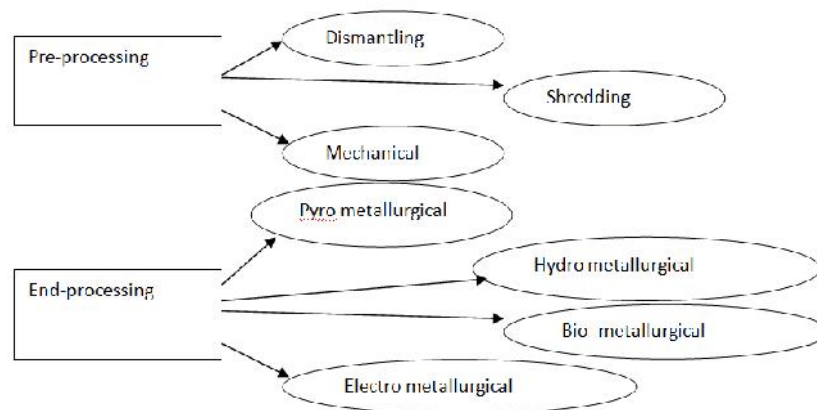
In Mumbai, many wards collect e-waste from educational institutes related from Dadar to Mahim and sending the waste to recycle in plants. In 2016, the Ministry of Environment issued regulations regarding proper management of e-waste. There is some enclosure for dealer, manufacturer and producers of electronic equipments as stakeholders. They were also responsible for collection, separation and recycling of e-waste generated from their activities.

But still only 20% of global e-waste is formally recycled the remaining 80% often incinerate or dumped in landfills. EPA funded **StEP** US based, collaborated with the Massachusetts Institute of Technology (MIT) and the National Center for Electronics Recycling (NCER) for e-waste management

### Solutions

We should have serious concern about unsafe handling of e-waste particularly in developing countries like India. There can be some solutions for that .

- Urban mining: Demand of electronic equipment increase day by day to meet our domestic requirement we should extract valuable metal from by reclaiming and reusing the material. China found that mining gold, copper and aluminum from ore 13 times more than recovering the metals through urban mining of e-waste.
- Government agency should be established for inventorisation of e-waste management. This can be suitable steps for recycling and disposal of e-waste in an organized manner.
- Consumers have also responsibility to understand certain workings. When they buy any electrical/electronic product, after certain years of use, they became expire. At that time, we should dispose them properly by selling such products to the organised sector.
- There should be some awareness programmes conducted to make the public aware about the real health problems caused by untreated e-waste and guide them to dispose the e-waste properly, through an authorized sector only.
- Through "Swachh Bharat" programme promoted by Indian Government, the country must be free of untreated e-waste also.
- Government should encourage the new entrepreneurs by providing the necessary technological guidance and financial support. Establishment of start-ups connected with e-waste recycling and disposal should be encouraged by giving special concessions.
- Treatment Methods generally used:



- **Pre-processing:** This step deal with physical disassembly of electronic devices, removing hazardous materials and unscrambling various streams such as metals, glass, and plastics. The remaining material that can't be manually separated is sent for shredding and then separation of metals from plastics and glass is achieve by using process such as magnetic and gravity separation.
- **End-processing:** It involves processes to recover valuable metals from the focus obtained after preprocessing and mostly used to recover and purify copper, gold, silver and palladium. The most widely used processes are pyro-metallurgy, hydro-metallurgy, electro-metallurgy and bio-metallurgy. There are 178 recycling units with a capacity of 441085.6 metric tons per annum.

**Conclusion**

The generation of e- waste in large quantities in recent years poses a serious threat to the environment and human health. This problem increase day by day not only in developed countries but developing countries also. For example there are problems with open air burning and acid bath being used to recover valuable materials from these electronic equipments. The unorganized sector has well connection network and organized sector is capital intensive. If both the sectors coordinate and work in proper manner the problem can be reduced. Like material collected by unorganized sector and give it to organized sector and they processed it in eco friendly way. In this work government can play a major role between two sectors for successful processing of the e-waste.

**References**

- ~ Agarwal R, Ranjan R,Sankar P,Scrapping the high-tech myth: Computer waste in India, New Delhi.Toxics Link;2003
- ~ Ahluwalia, P.K Nema, A K 2007, Resources, Conservation and Recycling 51 792-826.
- ~ Sheng,G. Pu. J., Wong M, 2009,Pollution categorization and diurnal variation of PBDES in the atmosphere of e- waste dismantling region. Environmental pollution 157:
- ~ EU Waste electric and electronic equipment; 2004 <http://europa.eu.int/comm/environment/waste/weee-index>.
- ~ International Journal of Scientific & Engineering Research, Volume 6, Issue 3, March-2015 28 ISSN 2229-5518
- ~ MAIT, "E-Waste growth in India"(online).Available: <http://mait.com/e-waste>.
- ~ MoEF(Ministry of Environment and Forest, Govt of India ,central pollution control board ) Amendment rules,2007,entry into force 12 March 2008.

