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A Survey on E-Waste: Challenges and Utilization in India

Kuldeep Tiwari¹, Vijay Kr. Dixit²

Assistant Professor, Department of Electronics & Communication Engineering, Indus Institute of Technology &
Management, Kanpur, India¹

Assistant Professor, Department of Electronics & Communication Engineering, Indus Institute of Technology &
Management, Kanpur, India²

ABSTRACT: As being the part of the world in category of developing country, it is quite necessary to think about the waste which is generated by electronic garbage. Unfortunately India has topped in generating E-waste. This garbage comes through from houses, educational institutions, industries and personal entertaining gadgets. Electronic waste is nothing but the excess of electronic devices in the country which thrown away when not functioning well. This electronic garbage contains a number of hazardous and toxic chemical elements which directly affects the human health and living atmosphere. Still it is very difficult to manage and recycle this E-waste in India especially because India is a big importer of Electronic components.

KEYWORDS: E-waste, Garbage, Hazardous, Toxic, Health, Global, Reusable, Scrap, Elements, Recycle, Gazette, Replacement, Utilization.

I. INTRODUCTION

Electronic waste (E-waste) or waste electrical and electronic equipment has become an emerging global environment issue and can be considered as Hazardous for living organism.[5] E-waste is often misinterpreted as related to old computers or IT equipment in general, while the synonymous term Waste Electrical and Electronic Equipment (WEEE) is also used in the international literature. E-waste is often misinterpreted as related to old computers or IT equipment in general, while the synonymous term Waste Electrical and Electronic Equipment (WEEE) is also used in the international literature.

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The used and spoiled electronic appliances such as computers, laptops, game devices, mobile phones, TV and video & audio players etc. which have disposed by their original users come in the category of E-waste. The electronic goods are classified under three major heads:[9]

- White goods: Household appliances.
- Brown goods: TVs, camcorders, Cameras
- Grey Goods: Computers, printers, fax machines, Scanners etc.

II. RELATED WORK

E-waste consists of more than 90% recoverable and reusable components. Some of them are highly precious and limited in India. As an example 100 million tons of e-waste consists of 30 million tons of steel, 4 million tons of

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aluminum, 6 million tons of copper and other materials like glass, plastic, silica, gold, platinum, palladium, iridium etc. in remaining. Almost 78% of e-waste scrap goes in land fill because of recycling cost in India.[6]

In India for an example, at least 20 million computers, 100 million cell phones, 12 million TVs, 8 million refrigerators, and 7 million washing machines have been abandoned annually.[7]

Here are the some components which can be generally found in E-waste and are hazardous in nature like PCBs, batteries, CRTs, toner cartridges, plastics & polymers, mercury containing elements, passive elements etc.[3]

Also some elements or compounds which are no doubt hazardous can be found present in E-waste like antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, tin, selenium etc.[5]

Percentage of metals especially iron and steel (in figures) is no doubt considerable and can be reused at home or recycled by the external agency.[1][5]

The percentage of components is further increasing in terms of PCBs which have highly toxic compounds leads to sewage health issues.

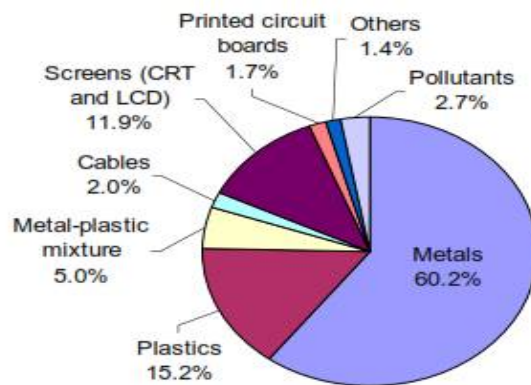


Fig. E-waste with percentage of components

Following figure shows how metallic and non-metallic compounds are contained by an electronic waste whose quantity is no doubt increasing as human is taking advantage of it.

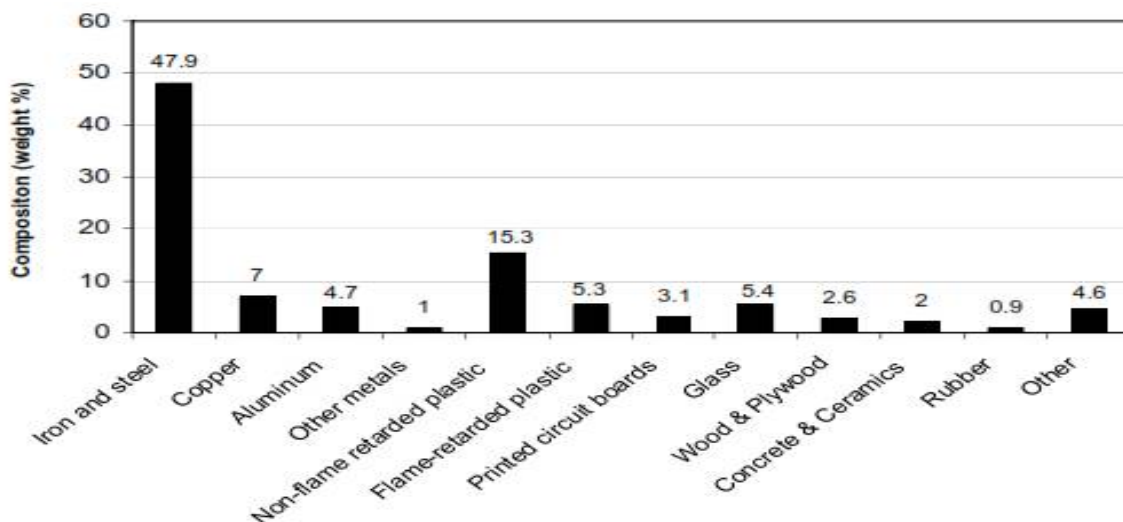


Fig. Contribution of Materials in E-Waste

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III. CHALLENGES IN UTILIZATION OF E-WASTE

At the same time there are certain challenges in India which are equally important to consider.

1. When new devices are procured, the old ones are becoming obsolete and are eventually being discarded, leading to these enormous amount of wastes.[5]

Generally, people in India never want to replace their old electronic gadget with new one, they desire to have all the collection of gadgets but at last they never hesitate to throw them away in open areas.

2. Majority of E-waste generators expects good return and also expects the recyclers must take away from their door steps & process at their costs and expenses.[6]

3. This challenge relates to responsibility, there is no specific provision under the law which makes it mandatory for the manufacturer to take back E-devices after use.[6]

Above challenges must be taken care for further better utilization of E- waste.

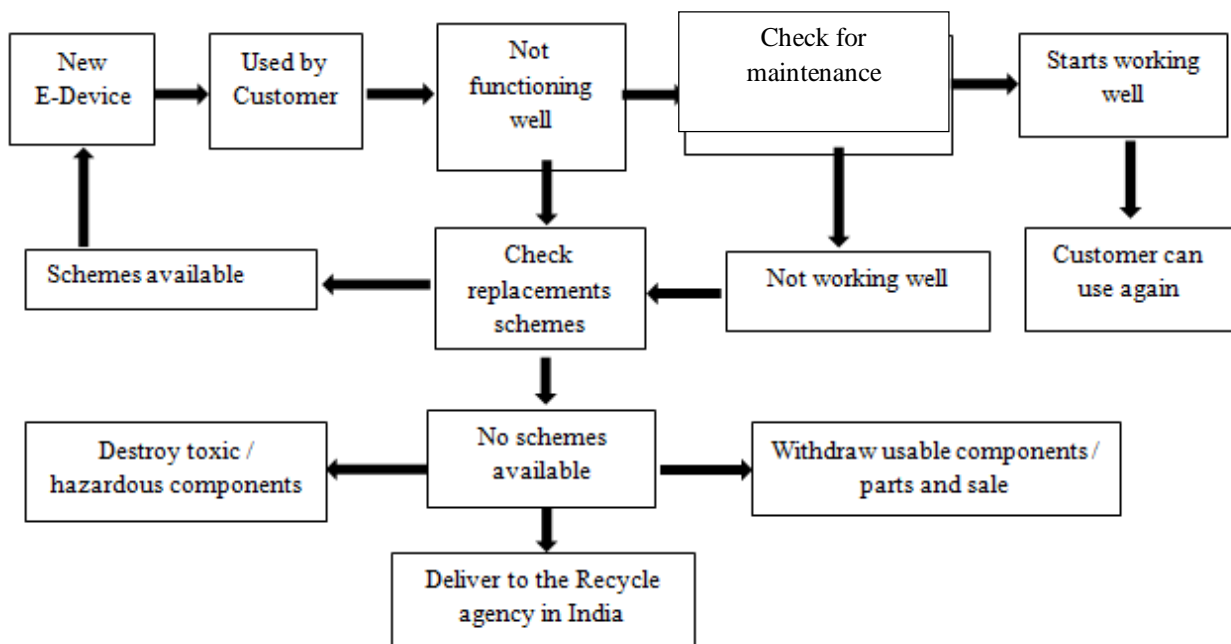
IV. SOLUTION FOR CHALLENGES

Considering above points of challenges, following steps/ points can be drawn for minimizing the challenges in India.

1. Adopt any replacement policy to minimize the collection of E-devices.
2. Contact to the recycle agency without expecting huge return for the waste.
3. Government may draft some rules and regulations for manufacturer to take back the E- device within some time period in working condition only.

System for best utilization of E-waste:

If, the system drawn below is adopted by the Indians then E-waste percentage will get reduced for sure.



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V. CONCLUSION

Although, Norway is the top E-waste producer in the world but India also comes on 15th position in producing huge amount of Electronic and Electrical waste.[1]

India imports 67% of total electronics demand which is after demand of petrol and gold but point to be mention here is that till mid 2019 India defeat gold and till 2020 India will defeat petrol.[2]

Motherboard of computer contains Beryllium (Be) which causes Carcinogenic (Lung Cancer) and skin diseases such as warts. Front panel of CRT contains Barium (Ba) which causes muscle weakness and damage to heart, liver and spleen.[4]

The System which is drafted here can play a vital role in proper utilization of E-waste produced in India. Also the individual responsibility is a dominant factor that depends on individual's interest.

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