INTERNATIONAL JOURNAL FOR INNOVATIVE RESEARCH IN MULTIDISCIPLINARY FIELD ISSN: 2455-0620 Volume - 6, Issue - 10, Oct – 2020
Monthly, Peer-Reviewed, Refereed, Indexed Journal with IC Value: 86.87 Impact Factor: 6.719
Received Date: 30/09/2020 Acceptance Date: 15/10/2020 Publication Date: 31/10/2020

"A Case Study on E- Waste - The Hidden Gold in Toxic Truth in India"

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Abstract**:** *Electronic waste is a typical, casual name for electronic items that reach to the finish of their helpful life. E-waste is not a waste, but treasure. It is phenomenal to discard gold, silver or platinum jewellery, yet that is not correct about electronic and electrical products containing same valuable metals. This paper is based on secondary data collected from various journal articles websites that features the treasure hidden in our gadgets with the development of a circular economy there is untapped potential in electronic waste. Such waste materials could be recycled for use in various businesses as valuable inputs. The main objective is to study the wealth hidden on the electronic gadgets. Recycle can influence metal supplies positively and thus protect the environment fighting dangerous landmines.*

Keywords*: E-Waste, Gadgets, Hazardous Components, Valuable Resources, Recycling.*

1. INTRODUCTION:

The number of mobile phone users in India is nearly about 813.2 million in the year 2019. The aspirational nature of the Indian consumer leads to the increase in use and manufacturing of electrical and electronic components in India. Technology evolution through the functionality and higher standards influences the Consumers update their devices frequently, hence the normal holding time of Digital devices by a consumer has additionally been dropping, and it is evaluated to be less than 2 years. Individuals additionally swap devices for smallest bother, for example, breakdown, slow-down or accessibility of more up to date model as the innovation changes and better gadgets hits the market, and replacement rates will increments. Not only technology inconvenience, either; device markets promote recycling, i.e. maintenance prices have made new devices more economical. We are looking at the millions of devices such as laptops; smartphones, old computers, computer peripherals etc. are discarded unscientifically in landfills, leads to E-waste. This is one of the fastest Rising waste streams in the planet. E waste contains many hazardous elements, and has a diverse chemical composition. In equal e-waste contains significant retrievable materials, for example, aluminum, copper, gold, silver and so on Reusing recuperates significant materials from old devices which can be used in manufacture of new items. This process of recuperation can furnish raw materials to market with lower natural impression than mining.

2. OBJECTIVE:

- To Study and Highlights the wealth concealed in electronic gadgets.

3. REVIEW OF LITERATURE:

Manish Kumar, Ashesh K Jharwal, C. Ghanshyam, M.L. Singla (2013), this paper specifically portrays that Recycling raw materials from end-of - life electronic gadgets is an important solution to rising e-waste problem. Recycling further reduces the quantity of greenhouse gas emissions caused by new product manufacturing. This also explains sustainability issues, and rewards. Paper explains as a recent category of the global waste disposal system as well as being the fastest developing segment of discarded waste worldwide and this developing issue on the planet as generally neglected or underestimated. Many people appreciate the value of making these obsolete devices properly disposed of, but even still often dump them into the trash or incinerators.

Ramachandra T.V, Saira Varghese K (2004), This paper clearly narrates the environmental and human health consequences of e-waste And it also explains how to treat e-waste By recycling and reusing, and by considering the administration options to be received to deal with large amount of E-waste and clarified policy obligations and duties if Government, citizen and Industries in waste treatment

Rajiv Ganguly (2016), This paper endeavors to give a short understanding into this idea of E-Waste, its production in India and the natural and wellbeing concerns appended to it. It also highlights the e-waste recycling economy in the

current informal and formal sector as well as the immediate need for more defined legislation and strategies to address this issue.

4. METHODOLOGY:

This paper is focused on secondary data from different sources, and an overview has been made of current literature on the topic. Secondary data are used for the purpose of the study. Secondary data are collected from websites, various articles and journals.

5. E WASTE IN INDIA:

Among top E Waste, producing nations India is positioned fifth. Management of electronic waste in India recognized that PC hardware represent practically 70% of E-Waste, followed by telecommunication devices telephones 12%, electrical hardware 8%, and clinical hardware 7% with household residue holding e-waste.

E waste produced in India is approximately 3.3 million TPA (Tones per annum). However, the amount recycled is about 438085 TPA. Joint similar to a Report by trade association ASSOCHAM industry group and IT firm NEC technologies The main e-waste contributors in India are Maharashtra which is about 19.8% , Tamil Nadu - 13%, Uttar Pradesh - 10.1%, West Bengal - 9.8 %, Delhi-9.5 %, Karnataka - 8.9%, Gujarat - 8.8% ,Madhya Pradesh-7.6%. There are 57 units in states like Karnataka with a capacity to process nearly 44,620 tones. As the largest producer of e-waste, Maharashtra has only 32 units which can process 47,810 tones, Uttar Pradesh has 22 units for processing 86,130 tones, Haryana has 16 units for processing 49,981 tones, Tamilnadu has 14 units for processing 52.427 tones, Gujarat has 12 units for processing 37.262 tones, Rajasthan 10 units of 68.670 tones and Telangana has 4 units of 11800 tons of operation. The tragic part is that a mere 5 percent of India's total e-waste is recycled due to weak infrastructure and over 95 percent of the e-waste produced is handled in this market by the unorganized sector and scrape dealers, disassemble the disposed goods rather than recycling them. By 2021, the global amount of produced E-waste is projected to hit 52.2 million tones. In 2016, the total value of all the raw materials present in e-waste is estimated at around $61.05 billion, which is more than the GDP of most countries around the world.

6. COMPONENTS OF E-WASTE:

Electronic waste comprise of enormous number of parts of different sizes and shapes, some of which contains dangerous components that should be evacuated for isolated treatment, for example, batteries, cathode beam tubes(CRTs), Asbestos squander, Printed circuit sheets, Liquid precious stone presentations, Gas release lights and so forth. From the purpose of material organization, electronic waste can be characterized as a blend of different metals especially copper, Aluminum, iron, gold, and palladium and so on. Mass Composition of metal for various electronic scrape samples has been delineated in beneath table.

Electronic waste	Mass(mgkg-1)							
	Fe	Cu	Al	Pb	Ni	Ag	Au	Pd
TV board Scrap	28	10	10	1.0	0.3	280	20	10
PC Board scrap	7	20	51	1.5	1	1000	250	110
Mobile Phone scrap	5	13	1	0.3	0.1	1380	350	210
Portable audio scarp	23	21	1	0.14	0.03	150	10	4
DVD Player scrap	62	5	2	0.3	0.05	115	15	4
Calculator scrap	4	3	5	0.1	0.5	260	50	5
Printed circuit Boards scrap	12	10	7	1.2	0.85	280	110	-
Electronic scrap	8.3	8.5	0.71	3.15	2.0	29	12	-
Typical electronic scrap	8	20	2	2	2	2000	1000	50

Source: Science direct.com

7. E WASTE MANAGEMENT:

There is no unique or appropriate e-waste system in the developing nations, every one of which has its own specific environmental, political, specialized, monetary and social conditions. . Electronic waste management is environmentally sound and acknowledges three ways of reducing, reusing and recycling. The main objective would be to minimize e-waste generation through intelligent development and maintenance.

The significant way to deal with handling e-waste is by processing and reuse to reduce the accumulation of these harmful chemicals and materials. Many fractions of e-waste are used as secondary raw material in the recycling or recovery cycle to reclaim useful products.

The recycle and recovery includes the following unit operations:

1) Dismantling: Removal of parts contains harmful substances (CFCs, Hg switches, PCB); expulsion of effectively available parts containing useful substances (cable containing copper, steel, iron, valuable metal containing parts, for example contacts).
2) Segregation of ferrous metal, non-ferrous metal and plastic: This partition is ordinarily done in a shredder procedure.
3) Refurbishment and reuse.
4) Recycling/recovery of valuable materials.
5) Treatment/removal of hazardous materials and waste: CFCs are dealt with thermally, PCB is burned or discarded in underground stockpiles, and Hg is regularly reused or discarded in underground landfill sites.

The most successful approach to the growing issue of e-waste is to reuse end-of - life electronic raw materials. Many electronic gadgets contain a range of components that can be recycled for potential applications, including metals. Through dismantling and making re-use prospectus, preserved natural resources are conserved and contamination of the air and water caused by toxic waste is eliminated. Recycling thus decreases the sum of greenhouse gas pollution from producing new goods.

8. ECONOMIC VALUE OF E-WASTE:

E-waste has become the fastest growing Trash system in the world . For us all who have dismissed phones or PC for a more current, sleeker model, the reasons are not really a secret. The production is fantastic, now. The e-waste boom underscores its dual nature as an ecological hazard as well as future potential economic instruments. Although often tainted with arsenic, mercury or other toxic substances, there are also useful elements such as gold, silver and copper in laptops and phones. The gold in the worlds e waste alone is more than a third of the gold extracted worldwide last year. And still lot of this fortune is directly reburied in landfills.

The raw materials used in e-waste in 2016 amounted to around $61 billion, more than the gross domestic product of even middle-income countries like Croatia or Costa Rica, according to U.N.U estimates. The valuable metal in e-waste is more abundant than in the most active mines, found especially in circuit boards. Americans toss out $60 million worth of phones in gold and silver per year. In recent days, metal processing has become more efficient and environmentally friendly, so that tech manufacturers may feel constrained to produce raw materials from their own end-of - life products rather than from the ground. For example, Apple has focused to using renewable resources or recycled materials to make all its future laptops and IPhones

Aside from metals, cell phones likewise contain significant materials, for example, plastics, glass and ceramics. With the improvement of a circular economy, these waste materials could be transformed into secondary materials, which could be utilized as valuable contributions to various companies. This reusing opens up an incredible open door for imagination, expanded productiveness and economic development.

9. CONCLUSION:

Electronic waste is a new kind of municipal solid waste that attracted much attention in the last decade. The existence of valuable and recyclable materials in the electronic waste has caused the electronic waste to be called as urban mines. The valuable metals that exist in the waste include 60% of the total weight of e-waste. New research shows that processing metals from e-waste is more cost-effective than virgin ores mined from mines. We do not need the new plastic to become precious minerals and metals. E-waste is not pollution, nor is it waste-it is a valuable resource, which we are only beginning to truly appreciate. E-waste value can be extracted in a manner that keep up the local economy and protects the health and environment of individuals. In fact, extracting the energy from recycled devices creates significantly fewer amounts of carbon dioxide than mining in the crust of the earth. These gadgets have a lot of precious metals and we really can reuse them because it takes a lot of efforts and resources to get them out of the earth and separate them from other materials. We know what urban mine is, we need more ingenuity in the field, to be able to

extract it. The role of cracking is to remove metals at a cost that can cope with new materials, and to explore and procure adequate quantities of that material to allow for a successful operation.

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