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Survey Paper on E-Waste Disposal

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Abstract: - *Central issue of the present study is electronic-waste (e-waste) that is rising as a brand-new environmental challenge for twenty first century. The rapid climb of the electronic and IT trade, gift client culture, increasing rates of consumption of electronic product have led to fateful environmental consequences. E-waste, while recycling, is also risky due to toxicity of a number of the substances which contains several cancer-causing agents. The implications and toxicity are thanks to discharge of lead, mercury, cadmium, metallic element and alternative virulent substances. Developed countries export this waste within the type of donation to developing countries. China and some Asian nations, where environmental standards are low, are the most important recipients of e-waste which, in most cases, is processed illicitly. The environmental burden of e-waste is born by people that sleep in developing countries. Despite varied laws and directives in developed countries, the e-waste management is uncontrollable. The current study focuses on the effect usage, marketing and use of marketing setting.*

Keyword: - Stilling Basin, Hollow-Jet Valve, Energy Dissipation, Roller bucket, Ogee Spillway, etc.

I. INTRODUCTION

Rapid changes in technology, changes in media (tapes, software, MP3), falling prices, and planned obsolescence have resulted in a fast-growing surplus of electronic waste around the globe. Display units (CRT, LCD, LED monitors), Processors (CPU, GPU, or APU chips), memory (DRAM or SRAM), and audio components have different useful lives. Processors are most frequently out-dated (by software no longer being optimized) and are more likely to become "e-waste", while display units are most often replaced while working without repair attempts, due to changes in wealthy nation appetites for new display technology. An estimated 50 million tons of E-waste are produced each year. The amount of e-waste being produced - including mobile phones and computers - could rise by as much as 500 percent over the next decade in some countries, such as India. The Environmental Protection Agency estimates that only 15-20% of e-waste is recycled, the rest of these electronics go directly into landfills and incinerators.

II. SOURCES OF E-WASTE

Computers, printers, scanners, webcam, mobile phones, music players, e-reader, etc. Problems associated with the disposal of e-waste: Dumping of e-waste will result in accumulation of plastic on land. The main sources of electronic waste in India are the government, public and private (industrial) sectors, which account for almost 70 per cent of total waste generation. The contribution of individual households is relatively small at about 15 per cent; the rest being contributed by manufacturers. As mentioned, electronic waste contains toxic components that are dangerous to human health, such as mercury, lead, cadmium, polybrominated flame retardants, barium and lithium. The negative health effects of these toxins on humans include brain, heart, liver, kidney and skeletal system damage. More than 95% of India's e-waste is illegally recycled by informal waste pickers called kabadiwalas or raddiwalas. These workers operate independently, outside of any formal organization which makes enforcing e-waste regulations difficult-to-impossible. It also said that the informal sector controls more than 90% of e-waste collection and handling processes in the country. Not surprisingly, neighbourhood kabadiwala is still the go-to source of waste collection for most people in the country. E-waste refers to the generation of waste from the engineering world which is dominated by the use of electronic /electrical devices and equipment.

1. Waste generated from the products used for data processing such as computers, computer devices like monitor, speakers, keyboards, printers etc.
2. Electronic devices used for entertainment like TV, DVDs, and CD players.

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3. Equipment or devices used for communication like phones, landline phones, fax etc.
4. Household equipment's like vacuum cleaner, microwave ovens, washing machines, air conditioners etc.
5. Audio, visual components such as VCRs, Stereo equipment etc.

Collection of E-Waste

Waste electrical and electronic equipment (WEEE) is recycled more and more and due to present legislation, the amount of unusable e-waste is decreasing.

E-waste Includes:

- Non-ferrous and precious metals,
- Alloys,
- Glass,
- Ceramics,
- Organic polymers with toxic content,
- Other substances like stabilizers, fillers and pigments.

According to European legislation **producers are obliged** to ensure the **collection** of individual types of e-waste from customers. The collection applies to all types of household e-waste. Similarly, e-waste is collected from legal and natural persons. Electrical and electronic equipment becomes waste after its delivery to a processor.

E-Waste Types:

Type 1- **Major appliances** (refrigerators, washing machines, dryers etc.)
Type 2 – **Small appliances** (vacuum cleaners, irons, blenders, fryers etc.)
Type 3 – **Computer and telecommunication appliances** (laptops, PCs, telephones, mobile phones etc.)
Type 4 – **Consumer electronics** (video and audio equipment, musical instruments)
Type 5 – **Lighting devices** (incandescent light bulbs, fluorescent tubes, gas-discharge lamps etc.)
Type 6 – **Electrical and electronic tools** (drills, saws, gardening devices etc.)
Type 7 – **Toys, leisure** (electronic toys, models, sports equipment)
Type 8 – **Medical devices** (all medical equipment with the exception of implants)
Type 9 – **Monitoring devices** (detectors, thermostats, laboratory equipment etc.)
Type. 10 – **Vending machines**.

III. UTILIZATION OF E-WASTE

Waste materials from other industries are being utilized in concrete productions such as fly ash, silica fume etc. The waste materials from electronics and electrical industries are divided in two categories hazardous and inert waste materials. The inert waste is also known as E-waste describes obsolete, discarded and malfunctioned electrical or electronics devices. It is very difficult to dispose-off the E-waste materials. In the present study the influence of E-waste as a partial replacement of coarse aggregate in concrete mixture is investigated. The mix design of M20 grade of concrete for normal mix (without E-waste) and with a partial replacement of coarse aggregates with E-waste material with 5%, 10%, 15%, 20%, 25% and 30% is carried out. The effect of E-waste particle size using less than 10 mm, between 10 to 15 mm and up to 20 mm on compressive strength of concrete cubes and flexural strength of beam is also studied. The compressive strength of concrete cubes and flexural strength of beam tests at 7, 14 and 28 days is determined with and without E-waste material.

It is observed that the compressive strength of concrete is found to be 20.35 % higher when coarse aggregate is replaced by 15% with two sizes of E-waste material. The flexural strength of concrete beam is found to be 15.69 % higher when coarse aggregate is replaced by 15% with two sizes of E-waste material. Generally, greater than 15% replacement with any size of E-waste is not practicable or useful for the construction work.

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Electronic waste or e-waste defines rejected electrical or electronic devices. Second hand electronics which are destined for recover, resale, salvage, recycling, or disposal are also considered e-waste. Electronic waste is an emerging concern posing serious contamination problems to the human and the environment. E-waste disposal is a typical task for whole over the world. Utilization of E-waste materials is a partial solution to environmental and ecological problems. Due to large amount of concrete use as the construction material availability of raw material is being questioned. Therefore, other replacing materials are needed to be finding out. E-waste is used as one such alternative for aggregate in concrete. This paper presents a summary on probable use of E-waste in concrete on the basis of different researchers and it marches strong possibility of E-waste being used as additional of aggregate as well as environmental impact. The use of natural aggregates in concrete will be decreased if different types of by-products is used in concrete as a substitute material. And it is more important to renovate the waste material.

IV. DISPOSAL OF E-WASTE

Cloud E-waste is electronic products that are unwanted, not working, and nearing or at the end of their "useful life." Computers, televisions, VCRs, stereos, copiers, and fax machines are everyday electronic products.

The ongoing challenge of how best to dispose of used and unwanted electronics isn't a new one and dates back at least to the 1970s. But a lot has changed since then, particularly the number of electronics being discarded today.

We also have something else today: a term for this issue. After several terms got suggested, including "Digital rubbish," a consensus formed around the simple word "e-waste."

List of Common E-waste Items:

Home Appliances

- Microwaves
- Home Entertainment Devices
- Electric Cookers
- Heaters
- Fans

Communications and Information Technology Devices

- Cell Phones
- Smartphones
- Desktop Computers
- Computer Monitors
- Laptops
- Circuit boards
- Hard Drives
- Home Entertainment Devices
- DVDs
- Blu Ray Players
- Stereos
- Televisions
- Video Game Systems
- Fax Machines
- Copiers
- Printers

Electronic Utilities

- Massage Chairs
- Heating Pads
- Remote Controls
- Television Remotes

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- Electrical Cords
- Lamps
- Smart Lights
- Night Lights
- Treadmills
- FitBits
- Smart Watches
- Heart Monitors
- Diabetic Testing Equipment

Office and Medical Equipment

- Copiers/Printers
- IT Server Racks
- IT Servers
- Cords and Cables
- Wi-Fi Dongles
- Dialysis Machines
- Imaging Equipment
- Phone & PBX systems
- Audio & Video Equipment
- Network Hardware (i.e., servers, switches, hubs, etc.)
- Power Strips & Power Supplies
- Uninterrupted Power Supplies (UPS Systems)
- Power Distribution Systems (PDU's)
- Autoclave
- Defibrillator

DIFFERENT METHODS TO DISPOSE E-WASTE

1. **Give Back to Your Electronic Companies and Drop Off Points**
   A lot of electronic companies tend to have an exchange policy whereby they take back your old gadgets when you buy a later version, sometimes offering you a discount on your new purchase.A few recycling companies have set up electronic drop off initiatives along with drop off points for products such as cell phones and tablets after which they are recycled. You can ask your local electronics shops regarding any information about drop off locations.

2. **Visit Civic Institutions**
   Enquire amongst your government, universities, and schools for any recycling programs they run as a lot of organizations have started assigning a certain day and place for environmentally conscious citizens to come and drop off their e-waste.

3. **Donating Your Outdated Technology**
   Old gadgets that you no longer need can be donated as they may be useful to others. Your old computer may be useful to either an NGO or students. You should ask yourself these 2 questions before disposing of your old electronics:
   - Is the electronic item working?
   - Does the computer have any of your personal information?

   A lot of organizations and businesses offer electronic donation programs which you can choose from.

4. **Sell Off Your Outdated Technology**

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One man's junk is another man's treasure as the old saying goes. This can be applied to helping you get rid of your old electronics. You can tap into online sites like OLX, eBay or even resort to having a garage sale as this will help you get rid of your outdated electronics as well as earning some money. Examples of this are old play station video games which can sell for as high as 1,000-2,000Rs/. Most electronic shops are always ready to buy your old electronics.

5. **Give Your Electronic Waste to a Certified E-Waste Recycler**

The positive aspect of e-waste recycling is that you have quite a few recycling options.

You need to find an e-waste recycler who is officially certified by the Basel Action Network (BAN). BAN is a non-profit organization of recycling companies which are dedicated to recycling e-waste in a safe and responsible way. All members have to make a pledge and display their Pledges of Responsible Recycling. So working alongside a certified recycler means that you don't have to worry about polluting another nation or risk losing your personal details to criminals.

Precautions to Take Before Donating or Recycling Your Electronics

- Upgrade your computer instead of simply replacing it
- Format all your personal information from your products before discarding
- Take out the batteries from your gadgets before getting rid of them

ADVANTAGES AND DISADVANTAGES OF E-WASTE RECYCLING

Advantages of E-Waste Recycling

Following are the advantages of E-waste recycling:

- E-waste consists of many useful resources in the form of components and materials. These are recovered and re-used again. This includes copper, gold, silver, palladium.
- The sorting of e-waste will provide above valuable materials which make up great amount of economic incentive.
- E-waste recycling is also essential due to presence of other metals/materials such as lead, nickel and various plastics.
- Due to above reasons, e-waste management is essential from the view of material and resource recycling.

Disadvantages of E-waste recycling

Following are the disadvantages of E-waste recycling:

- Health hazards to human being due to undisposed e-waste.
- Environmental impacts while recycling e-waste which leads to hazards/risks to humans.
- There are chemicals in the e-waste which are very harmful.
- There is a risk associated with placing e-waste on the land-fills. This is due to leaching as well as evaporation of hazardous substances.

V. CONCLUSION

E-waste recycling is necessary but it should be conducted in a safe and standardized manor. The acceptable risk thresholds for hazardous, secondary e-waste substances should not be different for developing and developed countries.

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