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RONGO UNIVERSITY SCHOOL OF INFOCOM; BSC. INFORMATICS YEAR 3.1

UNIT: Green Computing

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E-WASTE MANAGEMENT AND DISPOSAL METHODS.

- Currently following disposal methods are used to get rid of e- wastes they are incineration, acid baths, landfills.

Landfills

- E-wastes ending up as landfills are described as toxic time bomb. They may release to the environment after several years by natural means, and there is a possibility of leaching of wastes such as batteries releases acids and heavy metals mercury, nickel and cadmium, electronic circuits have lead, zinc, Nickel, Copper, Mercury and cadmium.
- These may reach the land water and reaches animals and humans, and mixes with other fresh water sources such as rivers and streams. Almost half the e-wastes of US and Australia are dumped as landfills while the rest are exported to Asia and Africa.

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E-WASTE MANAGEMENT AND DISPOSAL METHODS.

Acid baths

- Acid bath method is used to extract Copper, here the circuit board is submerged in to Sulfuric acid for about 12 hours to dissolve Copper then solution is boiled, precipitated Copper Sulfate is taken and remaining solution is added with scraped particles, subsequently Copper smudges are removed. Acid baths also used to dissolve the lead and in the extraction of Gold and silver.

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E-WASTE MANAGEMENT AND DISPOSAL METHODS.

Incineration

- Incineration also includes pyrolysis; substances generated during incineration are likely to be more toxic than its ordinary form, pyrolysis heating the substance in the absence of oxygen, here the burning does not occur but the substances are converted to fumes, oils and charcoal. However, in gasification limited air is given to convert the substances into fume, ash and tar. Incineration is a commonly used method of the dispersal of e- waste in China, Africa, India and Pakistan. When heating the plastic or PVC circuit board it releases erotic fume consists of Polycylic aromatics (PCA), polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs)which are known carcinogens and gases such as carbon monoxide, sulfur dioxide, nitrogen oxides. Smoke also consists of minor quantities of oxides of following heavy metal residues antimony, lead, thallium, arsenic, copper, manganese, mercury and nickel, reminder ended up in the ashes.

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SAFE METHODS FOR DISPOSAL OF E-WASTE AND MANAGING AUTHORITIES

- The Most safe method is recycling materials including metals and reusing them, which includes industry wide system for the collection of e-wastes.
- Implementing proper rules to make following as mandatory wearing protective masks and gloves and safety glass when dismantling.
- Avoid easy methods of extraction such as incineration which results harmful fumes.
- Avoid dumping and avoid using acid baths.
- Implementing strict rules against dumping e-wastes in landfills as it could leach out towards ground water or may be released after long time.
- Implementing proper storage system for collected and extracted e-wastes until it is reused as products.

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SAFE METHODS FOR DISPOSAL OF E-WASTE AND MANAGING AUTHORITIES

- Strengthen the implementation of agreed legislations of Basel convention and implementing potent laws to prevent political invasions or pressures.
- Take action against unapproved illegal e-waste collectors and dismantlers.
- Encourage research scientists in finding alternatives to hazardous chemicals and carcinogens.
- Banning the electronic products with hazardous ingredients.
- Monitoring the transportation of e-wastes within the state municipal limits as well as ports and harbors.
- Consulting with manufactures e-waste processors, environmental groups such as NRDC, Basel Action Network (BAN) have created a certification system for recycling, refining and refurbishing companies known as e- Stewards. E-steward certification assures the recyclers keep up the standards which allow the recycling process in a way that protects workers health and the environment. BAN also maintains a list of companies which are permitted to act as subscribed e-stewards (NRDC 2012)
- Educate the public on handling and disposal of e-waste through awareness programs.

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E-WASTE MANAGEMENT PRACTICES

- Segregation of Waste at source.

In some organizations waste is segregated at source and handed over to the service providers for further treatment. Some households segregate at source but the waste is mixed during collection. Currently E-waste is not collected separately from other waste streams.

- Collection

The existing collection centers are established individually or jointly or as registered society. They could also be owned by a designated agency, a company or an association to undertake collection operations of E-waste; The established collection centers contract or sub contract the E-waste collectors normally known as ‘scavengers’ to supply them with the waste.

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E-WASTE MANAGEMENT PRACTICES

- Transportation

Once general waste is collected at designated places, the contracted service providers collect and take it to dumping sites and recycling facilities for processing. The service providers are licensed for transporting waste by NEMA.

- Recycling

There exist both formal and informal recycling activities in the Kenyan market with scanty information on the volumes collected and processed. A Few companies have been licensed by NEMA as E-waste recyclers. In 2019, these companies included Waste Electrical and Electronic Equipment Centre (WEEE Centre), Sinomet Kenya, Sintmund Kenya and E-waste Initiative Kenya (Ewik).

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E-WASTE MANAGEMENT PRACTICES

- Refurbishing.

There is a growing number of licensed entrepreneurs and organized groups which are refurbishing E-waste in the country with the intent of increasing product lifespan.

- E-waste take back

There are efforts by a few manufactures who have introduced take-back programmes in the country. However, there is lack of consistency and awareness to the public.

- Trans-boundary waste movement

Kenya being a signatory to Basel Convection 1994, trans-boundary movement of waste includes import of waste originating from a foreign country into Kenya as well as export of waste outside country into another country and transit of waste through the country. However Kenya is not a signatory to the Bamako convention

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E-WASTE MANAGEMENT PRACTICES

We proceed in the next class still with management practices.