E-Waste: A Growing Challenge for Waste Management and Environmental Sustainability in India

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Abstract – Due to the increasing market penetration in developing countries e-waste becomes the one of the fastest growing waste streams. The presences of toxic and hazardous substances in electronic goods have adverse affects on environment. Here in this paper I offer an overview of threat of e-waste on woman health and environment including its management and disposal option. Management of e-waste mainly depends on four steps that are reduced, reused, recycle and last option is disposed. Preventing waste in the first place is the preferred management option which can be achieved to repairing and upgrading the equipment. Through recycling either reused or dismantled for recycling the silver, gold, lead and another heavy metal are recyclable. In India entire recycling occurs by unauthorized and unorganized sector where the process done in such a manner which cause to exploitation of woman health and also to environment. The least preferred option is to landfill e-waste. That's why it is important to create a national frame work in making rules for e-waste for the environmentally sound management of e-waste including wide public awareness and education.

Keywords: E-Waste, Hazardous Waste, Management of E-Waste, Recycling, Disposing, Public Awareness.

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1. INTRODUCTION

Rapid use of electronic equipments and equally rapid obsolescence of these products are the main causes of the fastest growing e-waste streams in the industrialized world. Electronic devices like televisions, computers, refrigerators, air conditioners, mobile phones etc contain various types of toxic materials which pose both occupational and environmental health hazards. E-waste also pollutes the adjoining environment severally. The dumping of e-waste, particularly computer waste in India and in developed countries has further aggravated the problem associated with waste management. Thus computer waste management is the major focus of this study. The paper initially summarizes the various sources for e-waste and their quantification.e-waste processing associated with environmental and occupational hazards are delineated by considering hazardous material and their composition. Our main target is developing of an appropriate strategy for betterment in the prevailing stream of waste management. Finally in this paper it is tried to outline the course of action for improvement in e-waste management covering technological improvement, institutional arrangement and operational plan etc. [1-4]

Electronic waste like outdated television sets, computers, old model cellular phones, VCRs stereo systems are abound the industrial world. Some estimates reveal that there are more than 300million obsolete or sagely unused computers in America. Apart from these massive numbers of television sets are turned into garbage by the advent of digital TVs. The even growing amount of junked phones, MP3 players and numerous other electronic gadgets are the main potential of e-waste. According to the calculation of Greenpeace only one quarter of the total electronic waste is recycled or properly treated before land filling. It is clear quietly that electronic waste is non-biodegradable. All the chemicals used in the production of the most of the electronic products are not so well known to us. Negative impact on environment is observed when electronic waste ends up in landfill. [5-8]

It is estimated roughly that 40 million metric tons of electronic waste (e-waste) is produced globally each year. In developing countries 13% of that waste is recycled. According to the UNEP about 9 million tons e-waste in the form of discarded televisions, computers, cell phones, and other electronic products are produced by the European Union, United Nations Environment Programme

(UNEP) also notes that this estimate of waste is likely too low. [9-13]

Informal recycling markets in China, India, Pakistan, Vietnam, and the Philippines handle 50% to 80% e-waste by shredding, burning, and dismantling the products in "backyards." Emissions from these recycling processes are causing damage to human health and the environment. [14-16]

E-waste comes from developed countries and the internal consumers of developing countries with rapidly growing economies. Recently an estimate reveals that India handles 70% of e-waste from other nations, But it is estimated by the UNEP that domestic television e-waste will be double, computer e-waste will increase into five times and cell phones will increases 18 times in India between 2007 to 2020. The informal sector's recycling practices cause health risks. [17-18]

2. CHEMICALS IN ELECTRONICS

Most of the electronics goods are made of a combination of plastic, glass and metals. These materials are not simply in a landfill. The makeup of electronic products consists of various chemicals, Most of them are carcinogenic. Monitors and circuit board of computers and televisions contain lead. Mercury is present in newer flat-panel monitors. Cadmium which is highly carcinogenic is found in certain batteries. Other hazardous chemicals like zinc, chromium, selenium, arsenic and PCBs or polychlorinated biphenyls are found in some electronics goods. Polyvinyl chloride which is commonly known as PVC is present in countless applications. It is guaranteed that the chlorinated dioxins will be released when these waste products are incinerated.

A report published of United Nations Environment Program (UNEP) reveals that nearly 90% of e-waste is being illegally dumped and traded. Yet there are no protocols or laws on the topic of e-waste disposal in many countries –especially in developing countries. Due to the growing black market, random dumping tons of e-waste in the developing world has emerged illegal traffickers. The internal components of discarded electronic products, especially heavy metals are one of the main causes of environmental risks. Different types of e-waste can negatively affect the planet and its inhabitants.

3. VARIOUS POLLUTION CAUSED BY E-WASTE

a) Air Pollution due to e-waste:

Many rudimentary e-waste 'processing plants' are not running ethically safe. To get the Copper, a valuable commodity, some e-waste trafficker's burn computer wires openly. The open burning of wire can release hydrocarbons into the air. The chemical stripping of gold-plated computer chips release brominated dioxins and heavy metals. A recent study of the environmental effects through worldwide show that the largest e-waste landfill in Guiyang, China, found airborne dioxins to be 100 times more prevalent than previously measured.

b) Water Pollution due to e-waste:

Cathode ray tubes, often found in older televisions, video cameras and computer monitors are often broken apart, the yoke removed and the shell is dumped. Contents in the shell, such as lead and barium, can leach through the soil and into the ground water of local communities. This leaching of lead and barium endangers for the people who drink and bathe in this water. Different types of wildlife which rely on the water to sustain are also affected.

c) Soil Pollution due to e-waste:

Another study of the Guiyang landfill which find wind patterns in Southeast China disperse toxic particles across the Pearl River Delta Region. The area which contains a 45 million population, is at-risk for the toxins entering the "soil-crop-food pathway". It is one of the most common ways in which heavy metals can enter the human body.

d) Effect of e-waste in information Security:

In addition to being a risk to the environment, e-waste also poses a potential security threat to both individuals and businesses. If a hard drive is not properly erased before it's thrown away, it can be opened, potentially putting sensitive information in the hands of the wrong people. Credit card numbers, financial data and bank account information can all be obtained by those trained to do so. There is a large organized crime ring in Ghana specifically dedicated to searching through discarded computer drives for data.

e) Human Exploitation due to e-waste

E-waste is a risk to the environment, it also poses a potential security threat to both individuals and business. If a hard drive is not erasing properly before throwing away, it can be opened by the wrong people. Credit card numbers, financial data and information regarding bank account can be obtained. There is a large organized crime gang in Ghana especially dedicated to searching through discarded computer drives for data.

According to the Borgen Report, 29.8 million people live in slavery globally. There are more people who are forced to submit themselves to dangerous and grueling work for a demeaning wage. It may be the only work available for them.

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A 90% e-waste is illegally traded; many criminals worldwide take benefit from the stripping and processing of e-waste by poorer laborers. These laborers are exposed to hazardous materials on a daily basis. Some of them are intimated to work for long hours.

4. Some ways to control the risks posed by e-waste:

Many international government bodies have promised action against the alarming rates of illegal and dangerous dealing with of the e-waste. A call to action was immediately suggested when UNEP presented its report in front of the United Nations. United States, the European Union and other countries have been scheduled unilateral talks in order to deal with cooperatively this emerging global crisis.

There are many ways to properly reuse or recycle electronic equipments -it is not by leaving your junk printer on the curb. A commission has been started by the 'Environmental Protection Agency' (EPA) to ensure proper dealing of e-waste in its website. The website includes the lists of recyclers who are certified to be ethically and environmentally sound. We can also search for different laws or local regulations. Opportunities to recycle e-waste are offered by many electronics retailers such as best buy stapler. One's eligibility for tax credits or store coupons may be dependent on whose he drops his obsolete devices off of local communities. Often have special days to collect citizen's unwanted e-waste.

5. CONCLUSION:

Recycling facilities exist in developed countries and stringent measures have been taken by the Government regarding disposal of e-waste. However due to high cost of recycling there are difficulties in implementing regulations and dealing with e-waste owing to increased activism by environmentalists. Despite concerns on the issues of fraudulent traders and environmentally unsound particles, it has been easier and cheaper for these countries to ship e-wastes to the developing countries where access and recycling of such discarded electronic goods makes a good economic option.

Reusing and recycling the e-waste is the main solution of e-waste management. Another solution is to put stringent measures on the electronic industry and common households for disposal of e-goods. Industry should invest more in using environment friendly materials. Design of the electronic item should simple and should disintegrate easily into individual component.

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