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Short Communication

E-WASTE - THE NEED TO ADDRESS

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ABSTRACT

Background: The development of science and technology has provided us with a whole new array of electrical and electronic products, rendering them affordable, revolutionizing the world with widely used cheaper electronic products, but also resulted in accelerated obsolescence rate of these products leading to increasing quantum of E-waste also referred to as **WEEE** (Waste Electrical and Electronic Equipment). India is the fifth biggest producer of e-waste in the world. Despite being a signatory to the Basel Convention, India still presents a gloomy picture.

Conclusion: There is a need of collaborative efforts to overcome the growing problem of e-waste. A joint effort of the government, the industries and the citizens is the need of the hour. We must opt for products with fewer toxic content, using energy efficient products, never disposing e-waste with garbage or household waste, using Take-back options.

Keywords: E-waste, informal sector, recycle, reuse.

INTRODUCTION

The development of science and technology has provided us with a whole new array of electrical and electronic products, rendering them affordable, revolutionizing the world with widely used cheaper electronic products, but also resulted in accelerated obsolescence rate of these products leading to increasing quantum of E-waste also referred to as WEEE (Waste Electrical and Electronic Equipment), electronic waste or e-scrap. It is a term used to cover all items of electrical and electronic equipment (EEE) and its parts that have been discarded by its owner as waste without the intent of re-use.[1] It may also been defined as "waste electrical and electronic equipment, whole or in part or rejects from their manufacturing and repair process, which are intended to be discarded".[2]

E-WASTE GENERATION- GLOBAL AND INDIAN SCENARIO

The global quantity of e-waste generation in 2014 was around 41.8 Mt (Million tonnes) and expected to be 49.8 Mt by 2018. The highest and the lowest amount of e-waste was generated in Asia and Africa which were16 Mt (3.7 kg per inhabitant) and 1.9Mt (1.7 kg/inhabitant)respectively in 2014. The top three Asian nations with the highest e-waste generation in absolute quantities are China (6.0 Mt), Japan (2.2 Mt) and India (1.7 Mt). What is alarming among these figures is that India was the fifth biggest producer of e-waste in the world in 2014.[2] Ten Indian states generate 70% of the total e-waste while 65 cities generate more than 60% of it. Maharashtra ranks first followed by Tamil Nadu in the list of e-waste generating states in India while among the

Indian cities. Mumbai ranks first followed by Delhi and Bangaluru.[2]

India despite being a signatory to the Basel Convention on the Control of the Trans-boundary Movement of Hazardous Waste and Their Disposal (the most comprehensive global environmental agreement on hazardous and other waste) presents a gloomy picture of the e-waste management.[3]

ENVIRONMENTAL AND HEALTH HAZARDS RELATED TO E-WASTE

High volume of e-waste is generated due to the rapid obsolescence of gadgets combined with the high demand for new technology and the poor design and complexity due to toxic materials attached to non-toxic components making the separation of materials for reclamation difficult, pose as few major challenges related to e-waste. Health issues related to workers and local residents exposed to the chemicals through inhalation, dust ingestion, dermal exposure and dietary may lead to physical injuries and chronic ailments such as asthma, skin diseases, eye irritations etc. Also there is informal sector domination[4] and lack of effective enforcement of e-waste regulations.Health problems associated with such toxins include impaired mental development, cancer, and damage to livers and kidneys justify the term 'toxic mines' referring to e-waste. But these modern 'urban mines' also contained an estimated 16,500 kilotons of iron, 1,900 kilotons of copper, 300 tonnes of gold (equal to 11% of the world's total 2013 gold production), as well as silver, aluminium, palladium, plastic and other resources with a combined estimated value of 48 billion Euros.1 Also the developed countries dump their e-waste into the developing nations and United States of America (42%) tops the list of nations from which India imports e-waste followed by China (30%) and European Union (18%)1. So there is a need for proper recycling of e-waste not only to minimize the hazards but also utilize the resources contained within them.

CATEGORIZATION OF E-WASTE

E-waste has been classified into six categories:

(1) Temperature exchange equipments (cooling and freezing) comprising of refrigerators, air conditioners, heat pumps [7 Mt in 2014]

(2) Screens and monitors [6.3 Mt]

(3) Lamps including straight flourescent lamps and LED lamps [1 Mt]

(4) Small equipments – examples are vacuum cleaners, microwaves, small medical device etc [12.8Mt]

(5) Large equipments [11.8 Mt]

(6) Small IT and telecommunication equipments including mobile phones [3 Mt]

E-WASTE MANAGEMENT

There is a greater need to manage the growing volume of e-waste by adopting the dictum of "Reduce, Recycle and Reuse" which is the basic principle of e-waste management as it stresses upon reducing the number of electronic and electrical equipment, reuse when the equipment is still working thus continuing the "life" of the product and recycling the equipment is disassembled and the components recovered and used to manufacture new products. Apart from this, other methods like inventory management, production-process modification, volume reduction and consumer awareness efforts too need to be taken into consideration.

The e-waste thus generated needs to be treated using the latest environmentally sound treatment technologies which comprises of three levels of treatment. The unit operations at the first level include decontamination, dismantling and segregation. The second level comprises of hammering, shredding and special treatment processes while the third level includes methods like smelting and thermal de-polymerisation.

E-waste Management And Regulatory Rules, 2011 need to strongly implemented.5Also these rules emphasize the concept of Extended Producer Responsibility where the producer is responsible for the entire life cycle of the product, especially for take back, recycle and final disposal of the product, thus extending his/her responsibility to the post-consumer stage of the product life cycle. The Solving the e-waste problem (StEP) Initiative which is a collaborative global initiative uniquely leading global thinking, knowledge, awareness and innovation in the management and development of environmentally, economically and ethically sound e-waste resource recovery, re-use and prevention needs to be followed.[6] The Best of 2worlds Initiative which seeks technical and logistic integration of 'best' pre-processing in developing countries to manually dismantle e-waste and 'best' end-processing to treat hazardous and

complex fractions in international state-of-the-art end-processing facilities needs to be brought to the limelight.

CONCLUSION

There is a need of collaborative efforts to overcome the growing problem of e-waste. A joint effort of the government, the industries and the citizens is the need of the hour. We must opt for products with fewer toxic content, using energy efficient products, never disposing e-waste with garbage or household waste, using Takeback options.

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