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TECHNOLOGY****DIGITAL INDIA SCHEME TO CLEAN INDIA CAMPAIGN E-WASTE  
MANAGEMENT****Harish Tailor\*, Anjani Kumar Dwivedi**\* Department of Chemical Engineering, Ujjain Engineering College, Ujjain-456010, (Madhya Pradesh)  
India.Department of Chemical Engineering, Ujjain Engineering College, Ujjain-456010, (Madhya Pradesh)  
India.

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**ABSTRACT**

In India, the quantity of “e-waste” or electronic waste has now become a major problem. Disposal of e-waste is an emerging global environmental and public health issue, as this waste has become the most rapidly growing segment of the formal municipal waste stream in the world. E-waste or Waste Electrical and Electronic Equipment (WEEE) are loosely discarded, surplus, obsolete, broken, electrical or electronic devices. In India most of the waste electronic items are stored at households as people do not know how to discard them. This ever-increasing waste is very complex in nature and is also a rich source of metals such as gold, silver, and copper, which can be recovered and brought back into the production cycle. So e-waste trade and recycling alliances provide employment to many groups of people. Improper dismantling and processing of e-waste render it perilous to human health and our ecosystem. Therefore, the need of proper e-waste management has been realized. It is necessary to review the public health risks and strategies to combat this growing menace.

**KEYWORDS:** E-Waste, Scenario, National Legislation, Working Groups.

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**INTRODUCTION**

At present, E-waste is mainly generated in countries of the Organization for Economic Cooperation and Development (OECD), which have highly saturated markets for electrical and electronic equipment (EEE). Although, the market penetration of EEE in industrializing countries is not very high, these countries show the fastest growing consumption rates for EEE, and thus large quantities of domestically generated E-waste would become part of the waste stream in the near future (ibid). Moreover, the global E-waste production keeps on changing due to the economic growth and the available technologies. Almost all the countries in the world, today, depend immensely on Information and Communication Technology (ICT) and other EEES for their growth and development. (Anwasha et al, 2013). Exponentially increasing production of computer hardware has posed major challenges of proper disposal of the waste (e-waste) produced by this industry. Current study focuses on the effect of usage, dumping and recycling of the electronic waste on the natural environment. (Bhoi et al, 2014). In the last 10 to 15 years, rapid growth and technology changes in electronics have led to an increasing turnover of computers, tablets, phones, display screens, printers and other electronics. Consequently, businesses – and households – have seen steady growth in the volume of their electronics needing safe and cost effective end-of-life management. Electronics being disposed of are commonly referred to as *e-waste*. The word e-waste, however, is a misnomer because it implies that such electronics have no value. (Delta Institute, Managing E-Waste) As a popular and informal term, electronic waste (e-Waste) is loosely refers to any white goods, consumer and business electronics, and information technology hardware that is in the end of its useful life (Khurram et al, 2011)

**E-WASTE INVENTORY**

The use of EEES is increasing every day in public services, household logistics, manufacturing sectors etc to support the infrastructural requirement in the country. The e-waste generation has affinity to population and GDP (**Gross Domestic Product**) of the country. Both are increasing at varied rate. The consumption of new electronic goods is an index of societal progress and further decides the country technological rank in the world. The waste generated depends upon the demographic, geographical, socio-economic perimeters etc. [Beigl *et al.*, 2008]. The e-waste is being generated more in urban area than rural as 31% of people are living urban areas in the country

[Population, 2014]. The use of these equipments like computers and its peripherals, servers, mobile phones, televisions, stereos is maximum in the society. However, other equipments are also being used for general and specific requirement. After EOL (End of Life), all equipments are supposed to be disposed of as per rule 2011. The infrastructure and inventory detail is the basic need for its disposal. A tentative estimate is available based on study conducted for e-waste generation. Presently, India is generating more than 8,00,000 tonnes annually comprising all kinds of EEEs discarded from intended use [MoEF, Guidelines, 2008]. Globally, 20 to 50 million tonnes per annum are being generated, which is 5% of the municipal waste at global scale [UNEP Press Release, 2006]. However, it will go up to 40 to 70 million tonnes by 2014/15 [IAER, 2009]. The per capita e-waste generation in India is about 1 Kg per annum. The present population of the country is 1250 billion. With this figure total e-waste accounts to 12,50000 tonnes per annum, which is merely 2.5% of the global production taking base of 40 million tonnes e-waste generated per annum. However, the per capita e-waste generation in EU is 14 to 15 times to India [Rajya Sabha, 2010.]. In India e-waste is increasing at the rate of 10% per annum [Ravi Agarwal, 2010].

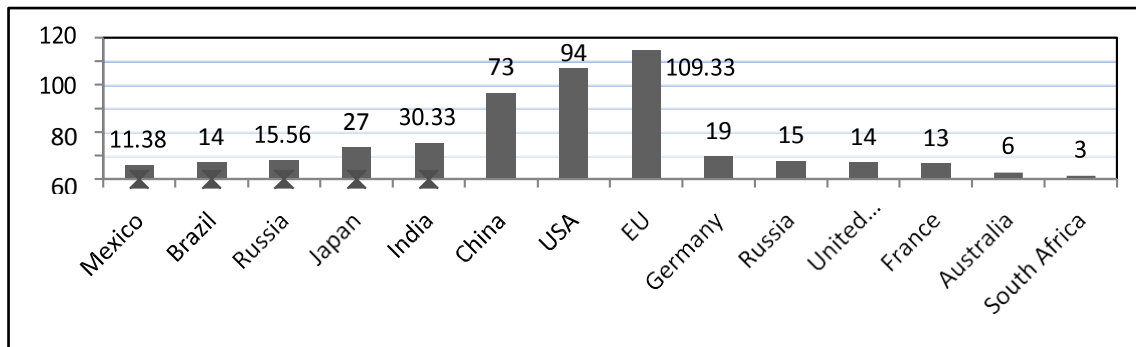


Figure 4 E-Waste Generation per year in  $10^5 \times$  tonnes in 2012 [StEP Initiative 2012]

However, in EU it is estimated that 3 to 5% per year. In e-waste generation, USA is leading followed by China by 30,00,000 tonnes and 23,00,000 tonnes respectively [Rajya Sabha, 2010]. It has become fastest growing waste in the municipal waste stream [Rajya Sabha, 2010]. However, in the past 1990s, the use of EEEs was limited and life span was also more. After, globalization and invent of new EEEs products enhanced the production of these equipments manifolds. The life span of the equipments has also reduced appreciably. Based on the study made, 4,00,000 tonnes of e-waste was being produced initially in 2010 [Ravi Agarwal, 2010] and further CPCB had also reported the e-waste production in the country as 1,47,000 tonnes annually or 0.573 metric tonnes per day in 2010 [Lok Sabha, 2010]. Also, a figure of 4,34,000 tonnes annual e-waste generation was estimated for 2009 [Poonam J. Prasad, 2012] and further estimated by CPCB that it will above 8,00,000 tonnes in 2013 [Moushumi Basu, 2010]. As such, the approach for e-waste production estimation and calculation is ambiguous. E-waste quantity is being anticipated but not authenticated formally as receipt as formal collection is yet to be devised by the CPCB.

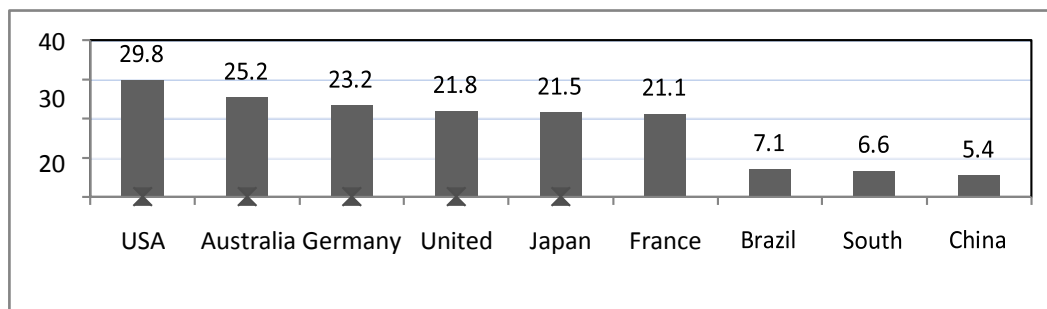


Figure 5 E-Waste Generation in Kg per Capita [Ref: StEP initiative, 2012]

Further predictions show an alarming e-waste generation at a faster rate in the country. By 2020, computer based e-waste will increase 500% and mobile phone 18 times with respect to the 2007 [Tom Young, 2010]. A glimpse of e-waste generation in 2009 by top ten states and metropolitan cities is presented in table. (Vats, 2014)

Table E-waste Generation [Consumer Voice,2009].

Sr. No.	States	E-waste Generated in MTA	Metropolitan Cities and others	E-waste Generated in MTA
1.	Maharashtra	20270.59	Mumbai	11017.1
2.	Tamil Nadu	13486.24	Delhi	9729.15
3.	Andhra Pradesh	12780.33	Bangaluru	4648.4
4.	Uttar Pradesh	10381.11	Chennai	4132.2
5.	West Bengal	10059.36	Kolkata	4025.3
6.	Delhi	9729.15	Ahmadabad	3287.5
7.	Karnataka	9118.74	Hyderabad	2833.5
8.	Gujarat	8994.33	Pune	2584.2
9.	Madhya Pradesh	7800.62	Surat	1836.5
10.	Punjab	6958.46	Nagpur	1768.9

(Vats, 2014)

**TODAY'S WORKING GROUPS ON E-WASTE****GLOBAL SCENARIO**

- RCN group AUCKLAND  
(www.rcn.co.nz)
- PCB INTERNATIONAL AUCKLAND  
(www.pcb.net.nz)
- GS Goodwill Industries International, USA  
(www.goodwill.org)
- EPICKUP, AUCKLAND  
(www.epickup.co.nz)
- Electronic Recyclers International (ERI) USA  
(www.electronicrecyclers.com,  
http://1800recycling.com,  
http://greenisgoodradio.com)

**NATIONAL SCENARIO**

- E-Parisaraa Private Limited, Bangalore  
(www.ewasteindia.com)
- Karma Recycling, New Dehli  
(www.karmarecycling.in)
- GEMS Recycling Privet Limited, Chennai  
(www.globalewastemanagement.com)
- WEEE Recycle, New Delhi  
(www.weerecycle.in)
- Eco Raksha, Karnataka  
(www.ecoraksha.com)
- Unique Eco Recycle, Indore  
(www.uerindia.com)

**RECENT FACTORS ON E-WASTE IN INDIA**

- All recyclers and dismantlers are suffering from breathing problems such as asthma and bronchitis and have a detrimental effect on the respiratory, urinary and digestive systems, besides crippling immunity and causing cancer, according to a study on 'Electronic Waste Management in India,' conducted by ASSOCHAM stated.

- About 76% of e-waste workers in India suffering from respiratory ailments like breathing difficulties, irritation, coughing, choking, tremors problems who all are engaged in various e-waste activities due to improper safeguards and dismantling workshops, an ASSOCHAM study coinciding with "Environment Day (June 5)" noted.
- Delhi-NCR is emerging as world's dumping yard for e-waste and likely to generate to an extent of 95,000 metric tonnes (MT) per annum by 2017 from current level 55,000 metric tonnes per annum growing at a compound annual growth rate (CAGR) of about 25%, a just-concluded ASSOCHAM study has revealed.
- In India, about 4.5 lakhs child labours between the age group of 10-14 are observed to be engaged in various e-waste (electronic waste) activities, without adequate protection and safeguards in various yards and recycling workshops, according to a recent ASSOCHAM study.(TOI-E-Waste management News.)

## FUTURE SCOPE

Indian Prime Minister Mr. Narendra Modi launched a scheme "Digital India". For the successful execution of this scheme there is a need of the lots of electronic equipment's in coming days. And at the same time Mr. PM has been focused on the IT sector, so the consumption of electronic gadgets will be increased. As the result of this scheme so many industries are launching varieties of gadgets and devices, which are easy to access the internet and helpful for the digitalization.

For Example:- Few cities selected for the "Smart City Project", where free internet (open Wi-Fi) will be provided to the entire city. To accomplish this target there is a need of different types of devices and cables.

To take benefit of easy and free internet latest handset and easy internet access devices will be required.

So, we can say as a result of Digital India Scheme the quantity of e-waste will be increased. The issue of E-waste is a future and unseen plank of Digital India Scheme. To overcome future problems it is very necessary to take action and make plans for such an issue. To achieve the complete success of Digital India Scheme it is important to find a way, which resolve the drawback of E-waste.

And the way is – A path between "Digital India Scheme" to "Clean India Campaign". The government should link both the scheme which helps to manage E-waste.

- Government should open E-waste collection center in every smart city.
- Every electronic manufacturer follow the plan in which their suppliers and shopkeepers manage a Take back store in their shops.
- Ministry of Information and Broadcasting should create a website which provide information to search for electronic recycling programs in different states. It should list different recyclers by state to find reuse, recycle or find donation programs across the country.
- NGO's should start campaign aimed to protecting human health and limiting environmental effects where electronics are being produced, used and discarded.
- People should contact the large retailers before they throw away their electronic devices.

## CONCLUSION

Currently, most waste management strategies are largely technical and focus on environmental aspects, leaving out underlying social problems and relevant solutions. (Lundgren, 2012). The e-waste management has become a complex and poses hazards to the environment in various ways and patients of chronic and acute diseases are increasing exponentially, however there may be obvious reasons for them. It is evident that air pollution is root cause of these diseases. (Vats et al, 2014) The world's fastest growing source of toxic waste comes from computers, cell phones, and other electronics. Although new residential legislation regarding electronic waste has been passed, even more electronics can be diverted from landfills and properly recycled by enforcing business regulations.(Franklin, 2011) The lack of public awareness regarding the disposal of electronic goods and inadequacy of policies to handle the issues related to E-waste enhance the problem in India. In most of the cases, the bulk of E-waste remains unattended in households and public offices. Rarely some sectors like some of the IT companies practice Extended Producer Responsibility or Take Back Policies. Due to the lack of awareness, some people discard E-waste with regular municipal solid waste which is an extremely dicey practice. People tend not to care about the faith of the waste once these are discarded, thus satisfying the principle of "out of sight, out of mind". Indian people are still to realize the associations between the cause of generation of E-waste and its effects including detrimental health and environmental effects.

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