

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES

E-WASTE MANAGEMENT: ISSUES AND PROSPECTS IN INDIA

Vijay Dawar*¹ & Krishna Bhuriya²

¹Dr.APJ Abdul Kalam University, Indore

²BLP PG Government College, MHOW

ABSTRACT

To manage the increasing quantum of E-waste in an Eco-friendly and resource friendly manner is a major issue for India as well as for world. The objective of the study is to analyze and explore the issues and prospects of E-waste in India. This paper focus to limelight the issues and prospects related to e-waste management in India. When electrical and electronic products reach the end of their useful life, they become waste electrical and electronic equipment (WEEE). To manage the increasing quantum of E-waste in an Eco-friendly and resource friendly manner is a major issue for India as well as for world. The paper discusses the E-waste in India. India is facing the problem of E-waste management due to the lack of awareness and proper knowledge of people about toxic and hazardous effect of E-waste on human being and on natural environment. Only 10% formal organized sector know about proper decomposition process of E-waste the rest 90% informal sector has unorganized. On the base of the study it has been found that there is need to more focus on issues and their solution related to E-waste.

Keywords: E-waste, Eco-friendly, EEE, WEEE.

I. INTRODUCTION

The electronic industry is one of the world's largest and fastest growing manufacturing industry. In the last couple of years it has played a vital role in socio-economic and technological development of societies. It transforms the world from mechanical to electrical/ digital/ virtual world. Now life of a common man has become slave of electrical equipments and he/she use to wake up with the same thing and till sleep in to the bed by all time he/she will be surrounded by these electrical and electronic equipments. With using of these electrical equipments to make our life easy and comfort we must think another face of the coin that is E-waste which is often refer to as Electronic Waste. There are so many types of wastes and e-waste is one of its types. When electrical and electronic products reach the end of their useful life, they become waste electrical and electronic equipment (WEEE). To manage the increasing quantum of E-waste in an Eco-friendly and resource friendly manner is a major issue for India as well as for world. Electronic waste or e-waste for short is a generic term embracing various forms of electric and electronic equipment that have ceased to be of any value to their owners. By releasing of toxic/ hazardous or e-waste components may cause severe health risks and environmental damage due to the unsystematic decomposes of E-waste.

India has one of the fastest growing electronics industries in the world and has ranked as Fifth largest Electronic waste producer in world. About 76 per cent of e-waste workers in India suffering from respiratory ailments such as breathing difficulties, irritation, coughing, choking, tremors problems are engaged in various e-waste (electronic waste) activities due to improper safeguards and dismantling workshops, a study by - ASSOCHAM showed. Approximate three million tons of E-waste is likely to touch in 2018. Computer devices account for nearly 70% of e-waste, with the contribution of telecom sector being 12%, medical equipment being 8%, and electric equipments being 7% of the annual e-waste production.

The Government, public sector and private sector companies generate nearly 75% of electronic waste; with the contribution of individual household being only 16%. City-wise, Mumbai tops the list in producing electronic waste, followed by New Delhi, Bangalore and Chennai. State-wise Maharashtra ranks first in generation of electronic waste, followed by Tamil Nadu and Uttar Pradesh. Electronic waste account for 40% of lead and 70% of heavy metals found in landfills. These pollutants are responsible for groundwater contamination, air pollution and soil

acidification. The Ministry of Environment, Forest and Climate Change has notified E-Waste (Management) Rules, 2016. The rules - for the first time in India - introduced Extended Producer Responsibility (EPR). EPR stipulates for collection 30% waste in first two years and up to 70% in seven years. According to ASSOCHAM, an industrial body in India the, Compound Annual Growth Rate (CAGR) of electronic waste is 30%. Nearly 95% of processing of electronic waste is carried out by the unskilled informal sector. "Computers, televisions and mobile phones are most dangerous because they have high levels of lead, mercury and cadmium -- and they have short life-spans so are discarded more," Dr BK Rao, chairman, ASSOCHAM Health Committee, said. There is a need for e-waste management as e-waste components may cause severe health risks and environmental damage, when crude, unscientific methods are applied for recovery of useful components. There is a need to encourage recycling of all useful and valuable material from e-wastes to preserve the natural resources.

II. REVIEW OF LITERATURE

Anwasha Borthakur and Kunak Sinha (2013), this paper tries to quantify the amount of E-waste generated in India with the related stakeholder involvement. Electronic waste (E-waste) or waste electrical and electronic equipments (WEEE), which is relatively a recent addition to the hazardous waste stream, is drawing rapid attention across the globe as the quantity being generated is rising rapidly. In this paper, the researcher has made an attempt to formulate an inventory of E-waste in the country in terms of both internal or domestic generation and illegal import.

Rajeev Ganguly, (2016), The existing practices of e-waste management in India suffer from quite a few disadvantages like appropriate inventory, unhealthy conditions of informal recycling, inadequate legislation, poor awareness and reluctance on part of the corporate to address the critical issues involved. This paper attempts to provide a brief insight into this concept of e-waste, its generation in India and the environmental and health concerns attached to it. Further, it highlights the e-waste recycling economy in the existing informal and the nascent formal sector and the immediate need for a more defined legislation and strategies to tackle this problem.

Rajesh Kumar and Karishma, (2016), This paper made an attempt to explain electronic waste or e-waste refers to unwanted, obsolete or unusable electronic and electrical products. Ever increasing usage of electronics and electrical equipments has resulted in piling up of e-waste. The current practices of e-waste management in India encounters many challenges like the difficulty in inventorization, ineffective regulations, pathetic and unsafe conditions of informal recycling, poor awareness of consumers and reluctance on part of the stakeholders to address the issues. As a result toxic materials enter the waste stream with no special precautions to avoid the known adverse impacts on the environment and human health as well resources are wasted when economically valuable materials are dumped. The purpose of this paper is to find out various issues related to e-waste and suggest strategies for effective e-waste management in India.

III. OBJECTIVES OF THE STUDY

1. To get an insight about management w.r.t. E-waste with the help of Review of Literature.
2. To analyze and explore the issues and prospects of E-waste in India.
3. To provide the suggestions to the Stakeholders.

Research Question

With the above in mind, the purpose of the present study was to explore the dimensions of management towards wastage of electrical and electronic equipments (WEEE) with special reference issues and prospects. Specifically, the study addressed the following research question:

What are the issues and prospects will face while managing the E-waste in India?

IV. RESEARCH METHODOLOGY

The present research paper follows a descriptive as well as exploratory methodology based on the secondary data in terms of quantitative review of the environmental and social aspects in the area of e-waste sector. An exploratory

methodology was adopted due to non-availability of ample information on e-waste. Data were collected through comprehensive analysis of quantitative data related to the topics that have been published in various sources mainly from various Government and NGOs' published reports, news articles, websites etc. This paper focuses to highlight the issues related to e-waste management in India.

Figure 1 highlights the top 10 E-waste generated countries in the world, China has generated the highest E-waste among all with 7.2 million metric tons every year, US, Japan followed by 6.3, 2.1 million metric tons respectively. India has 4th rank generated E-waste with 2 million metric tons. But when we consider calculating these 2 million metric tons E-waste in terms of Kg per capita wise, India has at 10th position with 1.5 kg E-waste generated per capita. Due to the largest population of India, the E-waste Kg per capita is very low among all 10 countries. On the other hand Germany has the highest E-waste generated 22 Kg per capita whereas it generates 1.9 million metric tons in a year.

Table 1 showed overall 10 states are generating approx 70% of total E-waste in the country. Near about 60% of total E-waste generated by 65 cities in India, draft revealed. While there is only few large-scale organised e-waste recycling facility available in the country and the rest entire recycling exists in unorganised sector, there are two small e-waste dismantling facilities functioning in Chennai and Bangalore. Also among the top ten cities generating e-waste, Mumbai ranks first followed by Delhi, Bangalore, Chennai, Kolkata, Ahmedabad, Hyderabad, Pune, Surat and Nagpur.

For the recycling of e-waste, India mainly depends on the unorganised sector as only a handful of organised e-waste recycling facilities are available. The biggest e-waste recycling market in India is Delhi and about 40 per cent of the e-waste in India lands here. Bangalore and Chennai are the next big e-waste markets. Chennai is the fourth largest e-waste generating city and approximately 5.0 MT of e-waste is generated every day in the Chennai metropolitan area. More than 95 per cent of the e-waste is treated and processed in the majority of urban slums of the country, where untrained or unskilled workers carry out the dangerous procedures without personal protective equipment, which are detrimental not only to their health but also to the environment, the study showed.

V. CONCLUSIONS

This study concluded that there is a huge increase in E-waste in India due to unaware of proper decomposes process of E-waste which leads to the hazardous disease. To manage E-waste is a typical task for Government as well as private organizations, only 10% organization are working in the formal way rest 90% are working in informal who have not having a systematic government approved road map of decompose system. On the other hand, E-waste management can be an opportunities which leads to generate employment. Government and public are more focuses on recycling of E-waste and Government is supporting through Prime Minister recycling scheme to fight with challenges of E-waste.

Suggestions

- ❖ There is urgent need of an effective Reverse supply chain management of E-waste. In the reverse supply chain of E-waste would be collected from all kinds of resources, and it would be delivered to a processor that can recycle valuable parts from E-waste and dispose rest hazardous components in environmentally sound manner.
- ❖ The Government and private enterprises must flow the updated information about E-waste is injurious to public health.
- ❖ Each state should develop its own scrap yards in the respective cities to warehouse e-waste.
- ❖ There is need to built ample of E-waste recycling plants and development of infrastructure to handle e-waste effectively by the government and private enterprises.
- ❖ Every individual of India has to take initiative to manage E-waste at small scale.
- ❖ People has to reduce the over use of EEE (Electrical and electronic equipments) and more focus on re-use of these products.
- ❖ Enterprise has to make EEE (Electrical and electronic equipments) more eco-friendly.

Limitations

- The present study is confined to India only on the basis of availability of secondary data,
- The facts and figures may vary from time to time, affecting their results.
- Selected factors were explored issues and prospects in the study through observation hence more analysis can be applied further to measure the other aspects of the study.
- The study was time bound.

Future Scope

- [1] This study will be useful for Researchers, Public and Private Sector Institutions, E –waste Management Consultants, and other Stakeholders w.r.t. management of WEEE.
- [2] The findings of the study can help the WEEE sector recycling organizations to work out on the areas where public are more concerned, especially towards all the factors which need attention of EEE sector organizations.
- [3] Present study can become the basis for other researchers to conduct the study in different cities, having different geographical backgrounds.

REFERENCES

- [1] Borthakur A., Sinha K., (2013), “Generation of Electronic Waste in India: Current Scenerio, Dilemmas and Stakeholders”, *African Journal of Environmental Science and Technology*, ISSN 1996-0786, Vol. 7(9), pp.899-910.
- [2] <http://www.academicjournals.org/AJEST>
- [3] Borthakur, A., (2014), “Generation and Management of Electronic Waste in the City of Pune, India”, *Bulletin of Science Technology & Society*, 34 (1-2): pp- 43-52.
- [4] Ganguly R., (2016), “E-Waste Management in India: An Overview”, *Scopus Compendex and Geobase Elsevier, Geo-Ref Information Services-USA, List B of Scientific Journals, Poland, Directory of Research Journals*, ISSN 0974-5904, Volume 09, No. 02, April 2016, P.P.574-588.
- [5] www.cafetinnova.org
- [6] Jayant, A., Gupta, P., & Garg, K. S. (2012), “Perspectives in Reverse Supply Chain Management(R-SCM): A State of the Art Literature Review”, *Jordan Journal of Mechanical and Industrial Engineering* , 6 (1), pp-87-102.
- [7] Kumar R. and Karishma, (2016), “Current Scenario of e-waste management in India: issues and strategies”, *International Journal of Scientific and Research Publications*, Volume 6, Issue 1, January 2016, ISSN 2250-3153, pp- 424-430.
- [8] Needhidasan, S., M. Samuel, and R. Chidambaram(2014), “Electronic waste - an emerging threat to the environment of urban India. *Journal of Environmental Health Science and Engineering*”.
- [9] Townsend, T.G. (2011), “Environmental Issues and Management Strategies for Waste Electronic and Electrical Equipment”, *Journal of the Air & Waste Management Association*, pp. 587-610.
- [10]Sinha-Khetriwal, D., P. Kraeuchi, and M. Schwaninger (2005), “A comparison of electronic waste recycling in Switzerland and in India”, *Environmental Impact Assessment Review*, 25(5): pp- 492-504.
- [11]<https://economictimes.indiatimes.com/news/politics-and-nation/76-of-e-waste-workers-suffer-from-respiratory-ailments-study/articleshow/47531421.cms>
- [12]<https://www.financialexpress.com/archive/ten-states-contribute-70-of-e-waste-generated-in-india/283644/>
- [13]<http://www.eai.in/lists/top-companies/bio/e-waste-companies-in-india>
- [14]<https://www.indiamart.com/proddetail/e-waste-recycling-plant-15448692291.html>