

The Idle Technology: E-Waste Management

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Abstract

This paper deals with the aftermath of the waste generated by technology. Rapid changes in technology have resulted in growth of the E-waste nationally and internationally. Over and above that, developing countries are becoming dumping zones of E-waste. It also tries to highlight the status of E-waste in India and the vulnerabilities of recycling E-waste.

Keywords: E-waste, Environment, Reuse, Technology, Recycling

Introduction

We are surrounded by electronic devices like computer, MP3 player, cell phones, digital camera, iPods and the list goes on and on. We see electronic devices all over and we are surrounded by electronic devices all day around. In recent decades, the use of electronic and electrical devices have increased significantly, leading to rapidly rising amounts of Waste in Electrical and Electronic Equipment (WEEE), often also called e-waste, throughout the world.¹ On an average we use electronic devices 20 hours a day. The entire range of electronic devices has an average age of 5 to 6 years. Each day we find technology becoming faster, lighter and cheaper, at the same time a great device is becoming antique, due to the technology which is upgrading at much faster rate than we can handle. The problem comes when we try to look into the outdated devices that are disappearing. We all have heard jingle in our neighborhood of scrap collectors. E-waste is often misinterpreted as related to old computers or IT equipment in general, while the synonymous term Waste Electrical and Electronic Equipment (WEEE) is the technical phrase used in international literature.²

Cause in increase of E-waste

The global e-waste production is assessed at 20-50 Mt/year.³ Rapid change in technology, low initial cost and planned obsolescence resulted in a fast growing surplus of electronic waste around the globe. Recycling electronic waste is very difficult and can be very costly. It is a major problem, for environment and human health because in India there aren't adequate processing plants and firms. Electronic waste is difficult

1 Alexandra Skinner, Yvonne Dinter, Alex Lloyd, Philip Strothmann, "The Challenges of E-Waste Management in India: Can India draw lessons from the EU and the USA?", *ASIEN* 117(October 2010), S. 7-26 [Hereafter ASYDALPS].

2 G. Gaidajis, K. Angelakoglou and D. Aktsoğlu, "E-waste :Environmental problems and current management", 2010, 193-198 [Hereafter GKKADA].

3 UNEP, "Call for Global Action on E-waste", United Nations Environment Programme, 2006.

to recycle, even if some parts of e-waste is recycled rest of the parts will get dumped into the landfills. The global e-waste production is estimated to increase due to the economic growth and the available technologies. The increase in GDP leads to increased purchasing of electronic goods and eventually to increased e-waste production.⁴

E-waste status in India

In India, yesterday's wanted and today's obsolescent devices become tomorrow's business. The main sources of electronic waste in India are the government, public and private (industry) sectors, which account for almost 70 per cent of total waste generation.⁵ On an average around 4,000 old computers are being dumped daily in India alone; if an average computer weighs around 28 Kgs imagine a total of more than 15,000 tons of e-waste being dumped into environment each year. A 2008 survey by the national government's central pollution control board said India generated 1,46,800 tons of e-waste in 2005.⁶ Every year around 50,000 tons of E-waste is imported to India illegally.⁷ Every year e-waste quantities increase by 3-5%.⁸ Over the last few decades, India has become a major destination for e-waste imports from OECD countries.⁹

There are 10 States that contribute to 70 per cent of the total e-waste generated in the country, while 65 cities generate more than 60 per cent of the total e-waste in India. Among the 10 largest e-waste generating States, Maharashtra ranks first followed by Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab. Among the top ten cities generating e-waste, Mumbai ranks first followed by Delhi, Bengaluru, Chennai, Kolkata, Ahmedabad, Hyderabad, Pune, Surat and Nagpur.¹⁰

A report of the United Nations predicted that by 2020, e-waste from old computers would jump by 500 per cent on 2007 levels in India. Additionally, e-waste from discarded mobile phones would be about seven times higher than 2007 levels and, in India, 18 times higher by 2020.¹¹

4 GSKADA, *op. cit.*, pp. 193-198.

5 E-Waste In India: Research Unit (Larrdis) Rajya Sabha Secretariat New Delhi June, 2011 [Hereafter 'E-waste India'].

6 Nilanjana Bhowmick, "Is India's E-Waste Problem Spiraling Out of Control?", May 23, 2011, New Delhi. <http://www.time.com/time/world/article/0,8599,2071920,00.html> (accessed on 20/Feb/2013) [Hereafter NB].

7 2007 Study by the Manufacturers' Association of Information Technology and German Agency for Technical Cooperation in India.

8 R. Hischier, P. Wager And J. Gauglhofer, "Does Wee Recycling Make Sense From An Environmental Perspective? The Environmental Impacts of the Swiss Take Back and Recycling System for Waste Electrical and Electronic Equipment (WEEE)", *Environ Impact Assess*, Rev. 25(2005), 525-539.

9 ASYDALPS, *op. cit.*

10 Disposal Of E-Waste', Rajya Sabha Unstarred Question No. 1887, Dt. 07.12. 2009. Also See, Sanjay Jog, 'Ten States Contribute 70% of E-Waste Generated in India', *The financial Express*, 13 March 2008.

11 Tom Young, 'E-Waste A Growing Problem For China And India', 22 February 2010. URL:<http://Www.Computing.Co.Uk>

E-waste regulation in India

Indians have been generating rapidly increasing amounts of e-waste domestically. As of September 2010, there was no comprehensive regulation in effect covering the management, recycling and disposal of e-waste in India and the import of WEEE into the country.¹² The regulation creates an economic disincentive to remove residues prior to export. Critics of trade in used electronics maintain that it is too easy for brokers calling themselves recyclers to export unscreened electronic waste to developing countries. Electronic waste is often exported to developing countries. India thus became a great dump yard of e-waste due to weak import restriction laws. Reuse and recycling of e-waste is not practised in wealthier nations. Environment Minister Jairam Ramesh says India's e-waste regulations are comparable to the best in the world. India has signed a \$90 million project with the World Bank.¹³

The following section examines the current regulatory framework for e-waste in India, examining existing legislation, voluntary e-waste guidelines released by the central government, and the new draft rules dedicated to e-waste management.

The Environment Protection Act (EPA), enacted in 1986 following the Bhopal gas tragedy, was the first comprehensive environmental law. The Act only defined hazardous waste in very broad terms and did not address e-waste at all. However, what it did do was confer the power to enact regulations concerning environmental issues on the executive. Since then, the precautionary and the "polluter pays" principle have both become part of Indian environmental policy. Yet despite these developments, no regulation on e-waste has been enacted and no Indian environmental law has implemented or enforced the concept of EPR to its full extent.¹⁴

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Although no definite official data exist on how much waste is generated in India or how much is disposed of, there are estimations based on independent studies conducted by the NGOs or government agencies. According to the Comptroller and Auditor- General's (CAG) report, over 7.2 MT of industrial hazardous waste, 4 lakh tonnes of electronic waste, 1.5 MT of plastic waste, 1.7 MT of medical waste, 48 MT of municipal waste are generated in the country annually. In 2005, the Central Pollution Control Board (CPCB) estimated India's e-waste at 1.47 lakh tonnes or 0.573 MT per day. A study released by the Electronics Industry Association of India (ELCINA) at the electronics industry expo - "Componex Nepcon 2009" - had estimated the total e-waste generation in India at a whopping 4.34 lakh

12 ASYDALPS, *op. cit.*

13 NB, *op. cit.*

14 ASYDALPS, *op. cit.*, S. 7-2.

15 ASYDALPS, *op. cit.*

tonnes by end 2009. The CPCB has estimated that it will exceed the 8 lakh tonnes or 0.8 MT mark by 2012.¹⁶

Vulnerabilities of Recycling E-waste

The vulnerabilities of recycling E-waste are vast. The Environmental Protection Agency estimates that only 15-20% of e-waste is recycled, and the rest 75 to 80% of the E-waste collected in India goes to informal sector for recycling. 'The informal sector is well networked, has a historic presence and provides fiscal incentive to consumers on the collection of waste'.¹⁷ Much of the domestic and imported WEEE ended up in illegal dismantling and recycling facilities where workers use processes hazardous to both their health and the environment.¹⁸ In informal section it takes just a minute to dismantle a computer with a hammer. They keep what can be recycle and rest directly goes to landfills and incinerators. If e-waste is dumped in a landfill or incinerated it spews toxins into the grounded water and poses severe health hazards. The health and environment risks of informal recycling are high. Extracting metals like copper and gold in open acid baths can releases toxins such as dioxins. Acid and chemical residues contaminate water and soil. The challenge relates not only to imported e-waste, but also to the increasing amounts of domestically produced WEEE.¹⁹

E-waste that contains harmful toxins causing health hazards

SUBSTANCES	FOUND IN	EFFECTS
Barium / Lithium	CRT Tubes and Lithium Batteries	Develops explosive gases (hydrogen)
Zinc Sulphide	Interior of a CRT screen	Toxic when inhaled
PCB (Polychlorinated biphenyls)	Condensers ,Transformers	Cancer, effects on the immune system, reproductive system, nervous system, endocrine system
Arsenic / Gallium Arsenide	Light-Emitting Diode (LED)	Acutely poisonous and on a long-term perspective injurious to health
Cadmium	CRT screens, batteries, circuit boards	Damages nervous system, circulatory system, kidneys, causes learning disabilities in children

16 'E-waste India', *op. cit.*

17 NB, *op. cit.*

18 ASYDALPS, *op. cit.*

19 *Ibid.*

Adaptation and Practices for Better E-Waste Management

Rapid economic growth in Asia and the increasing trans-border movement of secondary resources will increasingly require both 3R endeavors (reduce, reuse, recycle) in each country and appropriate control of International Material Cycles.²⁰

Awareness: For an effective and long term solution we have to train and have to improve the standard of our recycler and integrate them all. We have to spread awareness to public of E-waste problem. We should encourage all the electronic device users to use and buy products that are recycled and recyclable.

New Regulation: Need for stringent health safeguards and environmental protection laws in India.²¹ New regulation has to be designed where it can ban all hazardous waste exports. Proponents of international trade point to the success of fair trade programs in other industries, where cooperation can lead to creation of sustainable jobs, and can bring affordable technology to developing countries where repair and reuse rates are higher. If recycling and reuse of e-waste is done properly, it decreases the use of virgin raw materials and as a result it can benefit the environment. There should be a regulation where all the electronic manufacturing company should take responsibility to recycle all the e-waste and reuse the product in any form.

Electronic company: All the electronic manufacturing company and users should follow the Four Basic Principles



20 Atsushi Terazono, Shinsuke Murakami, Naoya Abe, Bulent Inanc, Yuichi Moriguchi, Shin-ichi Sakai, Michikazu Kojima, Aya Yoshida, Jinhui Li, Jianxin Yang Ming, H. Wong, Amit Jain, In-Suk Kim, Genandrialine L. Peralta, Chun-Chao Lin, Thumrongrut Mungcharoen, Eric Williams, "Current status and research on E-waste issues in Asia", 2006 [Hereafter 'E-waste Asia'].

21 'E-waste India', *op. cit.*

REDUCE the amount of trash discarded.

REUSE containers and products.

RECYCLE - use recycled materials and compost.

RESPOND to the solid waste dilemma by reconsidering waste-producing activities and by expressing preferences for less waste.

All the major IT Companies should come and encourage recycling and reuse.

Extended Producers Responsibility (EPR): It should be the full responsibility of the company to collect the e-waste and dispose of the product. They would have to ensure that the polluting products will be recycled in an environment friendly manner by refurbishers, dismantlers or recyclers.²²

Conclusion

The environmentally sound management of e-waste is a significant challenge for India.²³ E-waste management can play a major role in decreasing the use of raw materials and help in economical pricing in electronic device market. Alternatives for recycling technologies and materials must be developed.²⁴ We should make better policies for E-waste management and provide better facilities and equipments for recycling. There should be policies where in all the electronic manufacturing companies are enforced to take responsibility for recycling and reusing all the E-waste product in any form. Public awareness can play a major part in decreasing E-waste.

22 'E-waste India', *op. cit.*

23 ASYDALPS, *op. cit.*, S. 7-26.

24 'E-waste Asia', *op. cit.*