International Journal of Researches in Social Science and Information Studies (IJRSSIS)
January 2015
Volume-I, Issue-III
Online Journal
ISSN No. 2347-8268

MINIMIZING CYBER WASTE: ISSUES AND STRATEGIES FOR HANDLING

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Abstract:

It is widely accepted that some of the biggest challenges currently facing humankind are those related to environmental degradation, the overuse of limited resources (such as energy, land, water and materials) and the changing climate. The potential consequences of these changes for life on the planet are driving a paradigm shift in how we think about living, working and consuming. They require us to take action to prevent and mitigate further damage as well as to deal with the consequences of environmental degradation and climate change. Addressing the causes and consequences of environmental degradation presents significant challenges for humankind. In the last two decades, the global growth in electrical and electronic equipment production and consumption has been exponential. This is largely due to increasing market penetration of products in developing countries, development of a replacement market in developed countries and a generally high product obsolescence rate (United Nations Environment Programme, together with a decrease in prices and the growth in internet use.

Keywords: *cyber-waste, environmental degradation, issues and strategies*

Introduction:

As per Recycling International (2011), India currently generates 400,000 tonnes of e-waste annually, of which only 19,000 tonnes is recycled, according to manufacturers' association Mait. It believes around 40% of obsolete electronic products sit unused at home or in warehouses, as people do not know what to do with them and there is no systematic mechanism for dispose of them. Under the new rules, producers will have to issue consumers with information on disposing of equipment after use to prevent e-waste from being dropped in domestic waste, and must make the public aware of the hazardous components present. Commercial consumers and government departments will become responsible for recycling the e-waste they generate, channeling it to authorised collection centres or ensuring it is taken back by suppliers. They will have to maintain e-waste

records and make these available to state Pollution Control Boards or other authorities. NGO Greenpeace India welcomes the transition from the current out-of-sight, out-of-mind approach to proper recycling, but claimed the new legislation 'fails to provide safeguards' against the import and export of e-waste. It is widely accepted that some of the biggest challenges currently facing humankind are those related to environmental degradation, the overuse of limited resources (such as energy, land, water and materials) and the changing climate (Stern 2006). The potential consequences of these changes for life on the planet are driving a paradigm shift in how we think about living, working and consuming. They require us to take action to prevent and mitigate further damage as well as to deal with the consequences of environmental degradation and climate change (Margaret A. Hanson, 2013).

The Indian information technology (IT) industry has been one of the major drivers of change in the economy in the last decade and has contributed significantly to the digital revolution being experienced by the world. New electronic gadgets and appliances have infiltrated every aspect of our daily lives, providing our society with more comfort, health and security and with easy information acquisition and exchange (Sinha S. 2007).

Table I: Environment and health hazards (Source 1 &4)

Cyber waste components	Process	Potential occupational hazard	Potential environmental hazard
Cathode ray tubes	Breaking, removal of copper yoke and dumping	• Silicosis, Bronchitis • Cuts from CRT glass • Inhalation or contact with phosphor containing cadmium or other metals • lung cancer • Spirometric Hazard • Asthma and Chronic Pulmonary Obstacle Disease • Tuberculosis	Lead, barium and other heavy metals leaching into ground water and release of toxic phosphor, chemical emission

Printer circuit boards	Desoldering and removing computer chips	• Tin and lead inhalation • Possible brominated dioxin, beryllium, cadmium and mercury inhalation, Asthma and Chronic Pulmonary Obstacle Disease	Air emission and biological hazards
Dismantled printed circuit board processing	burning of waste boards	• toxicity and • Asthma and pulmonary diseases	Surface , air and water pollution
Chips and other gold-plated compounds	Chemical stripping using nitric and hydrochloric acid along riverbanks	• Dermatological problems, Irritation in eye and contact areas • CPOD (Chronic Pulmonary Obstacle Diseases) respiratory irritation to severe effects, including pulmonary edema, circulatory failure and death	• water pollution
Plastics from the computer and peripherals	Shredding and low-temperature melting	Burn injuries and chemical hazards	Emission of brominated dioxins and heavy metals and hydrocarbons
Secondary steel or copper and precious metal smelting	Furnace recovers steel or copper from waste	Circulatory and pulmonary hazard	Emission of dioxins and heavy metals
Wires	Open burning to recover copper	Burn injuries and pulmonary hazards	Hydrocarbon and ashes, including PAHs discharged into air, water and soil

Need to minimize cyber waste

Today almost all streams weather its IT, medicine, transportation, agriculture uses machines which indirectly requires large amount of power and money for its effective functioning. We have great machines and equipments to accomplish our tasks, great gadgets with royal looks and features make our lives more impressive and smooth. Green computing whose goals are to reduce the use of hazardous materials, maximize energy efficiency during the product's lifetime, and promote the recyclability or biodegradability of defunct products and factory waste. Therefore we use Green Computing for following benefits

- Using ENERGY STAR qualified products help in energy conservation.
- The Climate Savers Computing Initiative (CSCI) catalog can be used for choosing green products.
- Organic light emitting diodes should be used ins tead of the regular monitors.
- Surge protectors offer the benefit of green computing by cutting off the power supply to peripheral devices When the computer is turned off.
- Donating your old computers and other peripherals can reduce the rate of e-waste creation.
- Moreover, those who cannot afford to buy a computer can benefit from such donations. Through proper disposal of computers and its accessories, it is possible to reduce environmental pollution.
- It was expected that computers would help reduce paper wastage. However, even today wastage of paper is a serious issue in industries. The easy availability of photocopiers and printers is also one of the culprits behind unchecked paper wastage. Think twice before using printers.
- Use the device only if it is necessary.
- The manufacturing of disks and boxes needed for video games takes up a lot of resources. Video game manufacturers and softwares manufacturers can offer their games / software/ package and

practices online for download, leading to reduction in e-waste. This move can cutdown on the transportation/shipping cost.

- Use of 'Local Cooling' software can help in monitoring and thereby, bringing down the energy consumed by your computer. This 'Windows' program makes adjustments to the power options of your computer and helps minimize energy consumption
- The manufacturing of these devices and the use of rare materials that go into their production represent a huge source of embodied energy. Minimizing e-waste helps to conserve resources and reduces the amount of energy we take from the earth.
- Reusing the precious metals and plastics in old cell phones alone instead of making or mining more of them would save as much energy as flipping off the power to 24,000 US homes for an entire year.
- Re-evaluate. Do you really need that extra gadget? Try finding one device with multiple functions.
- Extend the life of your electronics. Buy a case, keep your device clean, and avoid overcharging the battery.
- Buy environmentally friendly electronics. Look for products labeled Energy Star or certified by the Electronic Product Environmental Assessment Tool (EPEAT).
- Donate used electronics to social programs—and help victims of domestic violence, children safety initiatives, environmental causes, and more. Ask your student REP for a postage paid mailer for your cell phone or ink cartridge.
- Reuse large electronics. Recycle electronics and batteries in e-waste recycling bins located around campus. Large electronics can go in the larger bins found in your building.

Rules Behind e-waste in India

The E-Waste (Management and Handling) Rules, 2011 has been notified by the Ministry of Environment & Forest, Govt. of India vide notification dated 12.05.2011 and these rules shall come into effect from 01.05.2012. As per the definitions given in the said Rules, E-Wastemeans

waste Electrical and Electronic Equipment, whole or in part or rejects from their manufacturing and repair process, which are intended to be discarded. Electrical and Electronic Equipment means equipment which is dependent on electric currents or electro- magnetic fields to be fully functional. Rules aimed at reduction in use of hazardous substances in electrical and electronic equipment by putting the onus of e-waste management on manufacturers today came into effect with the Central Pollution Control Board issuing guidelines in this regard. As per the guidelines of hazardous waste management division of Central Pollution Control Board, an arm of the Union environment ministry, there is a need to encourage recycling of all useful and valuable material from e-waste so as to conserve the ever depleting natural resources. Putting the onus of environmentally safe e-waste disposal on the manufacturers, it said, the producer is responsible for "setting up collection centres or take-back (electronic) systems either individually or collectively". The decision about the mechanism for collection can be decided by individual producer in accordance with their company policy. However, such details shall be specified while obtaining authorisation from state pollution control boards. The e-waste (management & handling) Rules, 2011 was notified to give various stakeholders adequate time to prepare themselves and also to place the required infrastructure for its effective implementation."These rules shall apply to every producer, consumer or bulk consumer, collection centre, dismantler and recycler of e-waste involved in manufacture, sale, purchase and processing of electrical and electronic equipment," the guidelines said.

However, the rules will not apply to lead acid batteries as covered under the batteries (management and handling) Rules, 2001, Micro and small enterprises as defined in the Micro, Small and Medium Enterprises Development Act, 2006 and radio-active wastes as covered under the provisions of the Atomic Energy Act, 1962.

Times of India Ist May, 2012 signifies that These Rules shall apply to every producer, consumer or bulk consumer involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or

components as specified in Schedule-I, collection centre, dismantler and recycler of e-waste and shall not apply to-

a. Batteries as covered under the Batteries (Management and Handling) Rules, 2001 made under the Act;
b. Micro and small enterprises as defined in the Micro, Small and Medium Enterprises Development Act, 2006 (27 of 2006); and
c. Radio-Active Wastes as covered under the provisions of the Atomic Energy Act, 1962 (33 of 1962) and rules made there under.

Lists of Common Facility Provider of E-Waste (collection centre) to whom Consent to Establish/Operate/Authorization under E-waste rules have been issued for collection, segregation and storage of E-Waste without dismantling and recycling

S. No.	Name	Address	Phone No.	Date of issue of Consent to Establish	Consent to Operate Issue Date	Aurthorization Order Issue Date
1.	Green E-waste Recyclers Pvt. Ltd.	A-5/3, Jhilmil Indl Area, New Delhi-110095	9818730873	11/05/2012	14/12/2012	14/12/2012
2	Greenscape Eco Management	348, Patparganj Indl. Area, Delhi	9810057555	07-09-2012	14-12-2012	14-12-2012
3.	Paramount Recycling Company	1/536-1/8, Old No.1/536-1,Friends Colony,Industrial Area, Delhi-110095	9837445715	15-10-2012	07-02-2013	07-02-2013
4.	Chintan Environment Research and Action	A-14, Ist Floor, GT Karnal Road, Industrial Area, Delhi-110033	24653560	17-11-2011	09-01-2013	20-02-2013

	Group					
5.	B.S. Chawla and Co.	D-1/95, Phase-II, Mayapuri Indl. Area, Delhi-110020	9811102355	05-07-2012	14-03-2013	14-03-2013
6.	V.K. Brothers	F-78, Mayapuri Industrial Area, Ph-II, New Delhi	9891238053	14-08-2012	14-03-2013	14-03-2013
7.	N.N. ECO Syestem.	A-294, Ph-1, Okhla Industrial Area, New Delhi-110020	8800709680 9899970888	15-10-2012	14-03-2013	14-03-2013
8.	Jainex Computers Pvt. Ltd.	Plot no. 87, Pocket-J ,Sector-1,Bawana Industrial Area, Delhi-110039	9811113617	22.01.2013	26.08.2013	26.08.2013
9.	Dildar Plastic	G-139,Sector - 5, DSIDC,Bawana Industrial Area , Delhi-110039	9868467080	23.04.2013	02.09.2013	02.09.2013
10.	Taj Computer Solution	B-2/28, Mohan Co-operative Industrial Area, Delhi - 110044	8800097758	2/05/2014	16/06/2014	16/04/2014
11.	Karma Recycling Pvt. Ltd.	F-27/2, Phase-II,Okhla Indl. Area, New Delhi-110020	9829154321	18.03.2013	27.09.2013	27.09.2013
12.	Amrit International	Durga Bhawan A68, Basement	9871155633	07.02.2014	17.04.2014	17.04.2014

		File Complex,Okhla, Phase--2,20				
13.	Sky Scrapers	F-196,Sector-2, DSIDC, Bawana industrial Area, Delhi	9312070919	05.06.2013	17.04.2014	17.04.2014
14.	M.S. Traders	No.3357, Sector-J, Dsidc, Narela Industrial Complex , Delhi-110040	9212128022	03.07.2013	17.04.2014	17.04.2014
15.	U print	E-196,Sector-02,Bawana Industrial Area	9810028133	07/01/2014	22/04/2014	22/04/2014
16	Global Solution	F-105, Phase-II,Mayapuri Industrial Area , New Delhi-110064	9212255643	3/08/2012	17/06/2014	17/06/2014
17.	Oggani sation for Ecocare	C-9, Phase-II , Mangolpuri Industrial Area, New Delhi-110034	9810136165	9/01/2013	10/07/2014	10/07/2014

Some of the Registered Recyclers of E-Waste with Central Pollution Control Board, in Northern India are as follows :

1. M/s Earth Sense Recycle Pvt. Ltd. , Plot No. 225, Sector-VI, IMT Manesar, Gurgaon, Haryana -122051, Telephone No: 0124-4368723, Fax no: 0124-4368723
2. M/s Greenscape Eco Management Pvt. Ltd. , H-1-472, Alwar, Rajasthan, Telephone No - 011- 40515662, Fax No. : 011-40515661

3. M/s. SIMS Recycling Solutions Pvt. Ltd. , J-2 and J-6, SDF Block-J, Noida Special Economic Zone (NSEZ) Noida Dadri Road, Noida, Uttar Pradesh -201305. Telephone / Fax No: 0120-4279233, 8800672244 , 97 177 89011
4. M/s Attero Recycling Pvt. Ltd., 173, Roorkee, Distt. Haridwar, Uttarakhand, Noida Unit :
   B- 92, Sector 63, Noida -201301 Telephone No: 0120-4087111, 4087100, Fax no: 0120-4087101

Non-Compliance of rules and Penalties

- Imprisonment for a term which may extend to five years with fine which may extend to one Lakh rupees.
- In case the failure or contravention continues, with additional fine which may extend to five thousand rupees for every day during which such failure or contravention continues after the conviction for the first such failure or contravention
- If the failure or contravention referred to in sub-section (1) continues beyond a period of one year after the date of conviction, the offender shall be punishable with imprisonment for a term which may extend to seven years.

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