



Assessment of Electronic Waste and Its Impact in India – Recent Scenario

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ABSTRACT

The term "e-waste" is applied to consumer electronic equipment that is no longer wanted. E-waste can include computers, printers, televisions, VCRs, cell phones, fax machines, stereos, and electronic games. Electronics may contain lead, copper, and other heavy metals or potentially toxic substances. It is critical to reduce e-waste by only buying what you need, reuse electronics that still work, and finally recycle electronics at the end of their useful life cycle. The increased production and consumption of electronic equipment has led to a rapid growth in e-waste. When improperly disposed of, this can be associated with health risks and toxic environmental pollution from lead, mercury and other toxic compounds found in most computers and monitors. E-waste is a particularly difficult issue to deal with as it contains many different materials and lots of extremely hazardous substances. Incorrect disposal can result in many dangerous chemicals damaging the air, the ground and the water. However India currently has no legal framework which deals specifically with e-waste related to computer and its product. It is a fact that the quantity of e-waste to be disposed of is growing rapidly throughout the world and developing countries contribute a sizeable share. E-waste volumes are expected to increase significantly in India in the near future. There's a productive future for used televisions and computer monitors, a future of reusing and recycling. Electronic waste (E-waste), banned from local landfills because of hazardous components, is a by-product of technology. Cathode ray tube (CRT) devices including TVs and computer monitors, LCD desktop monitors, laptop computers, and televisions contain hazardous materials and cannot be tossed into a landfill.

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1. Introduction

In this era of information and communication technology, the use of electronics and computational resources has grown exponentially. Excessive use of electronics equipment's has given rise to a number of adversaries such as high energy consumption, global warming, accumulation of e-wastes, environmental pollution etc. Faced with the

sever realities of global warming and rising energy costs, government agencies and private firms worldwide have started examining ways to protect the environment. To reduce the adverse effect, there is a growing global movement to implement more environmental friendly computing. It is estimated that 75% of electronic items are stored due to uncertainty of how to manage it. These electronic junks lie unattended in houses, offices, warehouses etc. and normally mixed with household wastes, which are

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finally disposed off at landfills. This necessitates implement able management measures. In industries management of e-waste should begin at the point of generation. This can be done by waste minimization techniques and by sustainable product design. Waste minimization in industries involves adopting.

- Inventory management,
- Production-process modification,
- Volume reduction,
- Recovery and Reuse.

Information and Communication Technologies (ICTs) play a significant role in areas of development such as health (Kleine & Unwin, 2009), education (Hayford & Lynch, 2003), et cetera. However, ICTs are expensive to acquire and maintain. Difficulty in acquiring ICT materials such as hardware and software in developing regions has led to consumption of second hand products and software piracy. Some of the second hand products that are extremely old are commonly referred to as e-waste (Schluep, et al., 2008). Besides affordability factors, Nnorom & Odjango (2007) suggest that e-waste is “internally generated or imported illegally as used goods in an attempt to bridge the so-called digital divide”. Economically, urbanization and the growing demand for consumer goods in different regions of the world have increased the demand and supply of electronic products (Babu et al., 2007). This will lead to increased volume of e-waste. For example Robinson (2009) shows that computers, mobile telephones and television sets will contribute 9.8 million tons in e-waste stream by 2015. These figures indicate that there will be a rise of 4.2 million in e-waste stream from 2010 to 2015 resulting from only computers, mobile telephones and television sets. A study by Greenpeace in 2008 estimated that, 25% and 20% of the e-waste is recycled safely in Europe and USA (Greenpeace, 2008). It also shows that China and India which have the biggest population in the world have large informal recycling sectors. For example 99% of India’s e-waste goes to informal recycling sectors. This indicates that biggest portion of e-waste generated worldwide is not properly recycled. It is clear that some of the discarded electronic gadgets contain highly toxic materials (Liu, 2009). Toxic materials can cause devastating health problems, for example cancer. In addition, e-waste pollutes the environment. Therefore poorly disposed ICT products such as computer hardware pose health threats to society. As the number of ICT users grows, e-waste will increasingly become an environmental/health hazard. Apart from the direct problems, this will also discredit ICT as a tool for development especially in poor regions. In relation to the above background, drastic measures are required to prevent e-waste from escalation.

2. Review of Literature

The e-waste concept came to light as far back as in 1970s and 1980s following environmental degradation that resulted from hazardous waste imported to developing countries (Shinkuma & Huong, 2009). In reaction to hazardous waste importation, the Basel Convention on the control of transboundary movements of hazardous wastes and their disposal was instituted in 1992 to control the situation. Since then many countries have become members of the convention. Research has estimated that nearly 75 percent of old electronics are in storage in part because consumers are uncertain of how to manage these materials. In addition, the computer industry is continually marketing new and improved products. As manufacturers make these technological advances, consumers follow the saying, “Out with the old and in with the new”. As a result, an overwhelming influx of e-waste is bombarding the world and challenging it to create an environmentally conscious disposal process. E-waste phenomenon continues to flourish due to rapid adoption and use of ICTs which has contributed to increase in e-waste stream. E-waste is said to be one of the fastest growing waste streams (Cairns, 2005); growing at a rate of 3–5% per annum i.e., approximately three times faster than an ordinary municipal solid waste (Davis & Heart, 2008). Increase in e-waste stream has attracted the attention of many governments, individuals and researchers due to its impact on the environment and human health.

Regarding e-waste management planning, the government has no specific solutions for e-waste. The government’s role is to provide guidelines, make the public aware of problems and solutions, formulate and implement domestic laws. Awareness of ICT environmental issues is almost nonexistent in Tanzania and the country’s current legal and regulatory framework is deficient (Tedre et al., 2009). The country has general national environmental regulations such as the NEP (National Environmental Policy) of 1997 that addresses management of hazardous waste, i.e., how to properly dispose-off waste in an environmental friendly manner.

The main sources of electronic waste in India are the government, public and private (industrial) sectors, which account for almost 70 per cent of total waste generation. The contribution of individual households is relatively small at about 15 per cent; the rest being contributed by manufacturers. Though individual households are not large contributors to waste generated by computers, they consume large quantities of consumer durables and are, therefore, potential creators of waste.¹⁵ An Indian market Research Bureau (IMRB) survey of ‘E-waste generation at Source’ in 2009 found that out of the total e-waste volume in India,

televisions and desktops including servers comprised 68 per cent and 27 per cent respectively. Imports and mobile phones comprised of 2 per cent and 1 per cent respectively.

A major reason for the rapid generation of e-waste and the resulting growth of the recycling market can be found in the high rate of obsolescence in the electronics market. Most electronic goods, especially in the West, have very short lifespan. Such goods are routinely replaced at least every two years, and then either simply discarded or exported to developing countries where there is still a demand for second-hand merchandise. In a programme called “Following the Trail of Toxic E-waste”, 60 Minutes of CBS News.com traced the route of toxic electronic waste illegally shipped from America to China via Hong Kong. In this programme, Allen Hershkowitz, a senior scientist and authority on waste management at the U.S. Natural Resources Defence Council, was quoted saying that the problem with e-waste was that it was the fastest-growing component of the municipal waste stream worldwide. When asked what he meant by “fastest-growing,” he said that about 1,30,000 computers were thrown out every day in the United States and over 100 million cell phones were thrown out annually.

Computer and computer components.

The electronics industry is driven mainly by the computer and computer component sectors with as much as a fifth of its revenues coming from sales of Personal Computers. The huge scale of demand in the market can be observed from the sale of the P.Cs.

Personal computers sales have seen a major jump in the last few years from around units of 3.1 million in 2003-04 to 7.3 million in 2007-08 approximately. It dropped to 6.7 million units in 2008-09 during the recession but the industry once again picked up in 2009-10. The total sales of personal computers for the quarter October - December 2009 were 2 million (20 lakh) units, registering a growth of 42 per cent over the same period in the previous fiscal year. In the same quarter, the sales of desktops stood at 1.35 million (13.5 lakh) units, while netbooks and notebooks taken together recorded a consumption of 0.66 million (6.6 lakh) units growing 27 per cent and 90 per cent respectively, on a year-on-year basis. Overall PC sales for 2009-10 are expected to cross 7.3 million (73 lakh) units, registering a 7 per cent annual growth. A shift in the governance systems with e-governance initiatives adopted by the Central and the State Governments, the telecom, banking and education sectors, Small and Medium Enterprises (SMEs) and IT enabled services have been a major factor leading to the vibrancy of consumption in the information technology market. The third quarter of 2009-10 had also seen an increase in consumption in households and smaller towns. Today, the small cities

constitute close to 50 per cent of the sales of personal computers. Region wise, the personal computers market has grown in the eastern and western regions indicating a progressive application of technology in governance and the common person's life.

3. Results and Discussions

Results show China is the leading exporter of cheap ICT products most especially mobile phones and their accessories. These cheap products are of low quality thus their lifetime is short.

All governments encourage use of brand new products. On the other hand people prefer cheap goods and thus old and refurbished products are also used. In countries such as Japan and U.S where old products are restricted, old products are imported under the umbrella of NGOs or through black markets.

E-waste awareness in India is non-existent. One of the respondents stated that “it has never been an issue in India and e-waste lies mostly in houses not in streets”. The government has no strong plan for e-waste management and there is no proper recycling policy either. Although some environment management officials in the government are aware of the problem, “only some people have brought the issue to regulators and the public”.

4. Conclusion

This study investigated the conceived role of governments in reducing electronic waste and compared the results to current state of e-waste management worldwide. It also re-defines e-waste to portray the divergent definitions in e-waste literature.

Below are some suggestion for the remedial measure for e-waste generation: governments conceive their role in combating negative impact of e-waste by serve as regulators and problem investigators

- Educate and sensitize citizens through environmental campaigns.
- Support private sector organizations and NGOs through incentives such as tax rebates and land allocation where company operations can be carried out.
- Promote practices for greener environments.
- Collaborate with other countries through conventions to control transboundary movements of hazardous material and environmental pollution.

- Governments are following international agreements to control movement of hazardous materials to and from the country. This is done in many countries

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