



E-waste Management of Bangladesh

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ABSTRACT

Safe management of electronic and electrical waste (e-waste/WEEE) is becoming a major problem for many countries around the world. In particular, developing countries face a number of issues with the generation, transboundary movement and management of e-waste. It is estimated that the world generates around 20–50 million tonnes of e-waste annually, most of it from Asian countries. Improper handling of e-waste can cause harm to the environment and human health because of its toxic components. Several countries around the world are now struggling to deal with this emerging threat. Although the current emphasis is on end-of-life management of e-waste activities, such as reuse, servicing, remanufacturing, recycling and disposal, upstream reduction of e-waste generation through green design and cleaner production is gaining much attention. Environmentally sound management (ESM) of e-waste in developing countries is absent or very limited. Trans-boundary movement of e-waste is a major issue throughout the region. Dealing with the informal recycling sector is a complex social and environmental issue. There are significant numbers of such challenges faced by these countries in achieving ESM of e-waste. This article aims to present a review of challenges and issues faced by Asian countries in managing their e-waste in a sustainable way. Bangladesh is a country of moderately rapid economic growth with emerging market for consumers of electric, electronic gadgets and home appliances etc. from home and abroad. These are used and reused in several times and dimensions. Equipment is largely refurbished and recycled in semiformal and informal sectors. Reuse or recycle of equipments as well as dumping are creating risk in the recent times. These electronic wastes cause environmental and health hazards for living and non living part in different ways. Presently, there are lack of public awareness and adequate information gap on e-waste hazards in the Country. Old electronic devices and residues toxic chemicals and heavy metals. A study has been conducted and a research survey in order to address this problem and to create mass awareness and learning initiative on e-waste through a sample project focusing only Dhaka and Chittagong city. This report will give an idea of present scenario analysis, gaps and recommendations for way forward. This research report has been written based on primary data as well as the secondary sources of information.

1.1 Introduction

Advances in the field of science and technology brought about industrial revolution in the 18th Century which marked a new era in human civilization. In the 20th Century, the information and communication revolution has brought enormous changes in the way we organize our lives, our economies, industries and institutions. These spectacular developments in modern times have undoubtedly enhanced the quality of our lives. At the same time, these have led to manifold problems including the problem of massive amount of hazardous waste and other wastes generated from electric products. These hazardous and other wastes pose a great threat to the human health and environment. The issue of proper management of wastes, therefore, is critical to the protection of livelihood, health and environment. It constitutes a serious challenge to the modern societies and requires coordinated efforts to address it for achieving sustainable development.

"Electronic waste (E-waste)" may be defined as all secondary electronic goods including computers, entertainment device electronics, phone sets / mobile phones sets, Air coolers, televisions, VCRs, stereos, copiers, and fax machine, electronic Medical & dental equipments, refrigerators, whether sold, donated or discarded by their original owners. Many of these products can be reused, refurbished or recycled. Unfortunately, electronic discards is one of the growing segments of our nation's waste stream but mostly these are ignored.

First of all, to understand the present scenario of e-waste estimation has been needed to measure the total volume of e-waste since for a prolong time. To make a simple estimation 10 years have been considered. Up to 1981 the urban population rate of Bangladesh was 18% of total population. E-waste containing products Heavy metals & toxic substance release from e-waste :

- Televisions and computer monitors,
- Computers and computer peripherals (e.g. monitors and key boards),
- Audio and stereo equipments
- Mercury
- Lead
- Cadmium
- Zinc
- Chromium etc.

2. Statement of the Issue

Environment and Social Development Organization (ESDO) commenced a study focusing Dhaka city and Chittagong to examine the trend of usage of electronic devices /gadgets and what is been done during end of these equipments, what hazards are been created from these e-waste, what are the current practices of dumping and what rules are there for dumping these sludge. Finally, this study has tried to identify the level of awareness regarding these e-waste and way forward to reduce environmental hazards.

The purpose of the paper is to improve understanding of electronic waste (e waste) and the effect on health and the environment on a global scale. The project involved examining data and policies of governmental, national, and global organizations in dealing with electronic waste and recycling efforts from 1980 to 2008. Methods of recycling were examined as well as the hazardous composition of electronic components and the result on the environment. Data on human health were provided from studies (Huo, 2007; Li, 2006; Schmidt, 2006) of major waste recycling sites in Africa, India and China.

2.1 Objective of the study

1. To identify the scenario/situation of e-waste which has been generated in Bangladesh mainly Dhaka and Chittagong city;
2. To analyze the management system of dumping of e- waste;
3. To describe the impact of e-waste on environment and health in Bangladesh;
4. To stop e-waste generation through a policy and law enforcement;
5. To educate and aware the users about the hazards of e-waste associated with computer technology.

2.2 Methodology of the Study

The basic question and purpose of this research was to analyze levels and characteristics of electronic waste (e waste) and its effect on the environment and human health. The intended result and outcome of this study was to determine if there was a need to control, reduce, and properly dispose of obsolete or unwanted electronic devices. Environment and Social Development Organization (ESDO) has conducted survey in (September 2009- June 2010) in Dhaka, capital of Bangladesh on the volume of e-waste generation of six products among at least four target groups of each one. Each group consisted of 10 members except mobile set. 30 members there due to large number. Six products are Television, computer, mobile, CFL bulb, medical and dental equipments. Target groups were importers, retailers, repairers and users of each product.

Scope of the problem

The scope of the study was limited to electronic waste. Other types of waste including organic, recyclable, soiled, and toxic were not included. Specifically, electronic waste was the fastest growing component of the waste stream and continued to grow each year (EPA, 2008b). Involvement in this project consisted of data provided by outside sources. The data described those involved as recycling workers in the United States, China, Africa, and India. Participants also included state, national organizations, and governments. Policies and regulations also played a role in the outcome of how electronic waste was handled.

3. Findings of the study and analysis: Snap shot of present practices of these six products

In every year Bangladesh generated roughly 2.8 million metric tons of e-waste. But without knowing the harmful effect of the e-waste, these have been dumped in to the open Soil, arable land and in the open sources of water bodies.

- Health impact: Cancer, Asthma, Nerves breakdown, Hearing problem, Visual problem, Infant-mortality, disable baby birth.
- Environmental impact: Air pollution, Water pollution, Soil pollution and life threat for wildlife
- In Bangladesh every year more than 15% child worker died during and after effect of e-waste recycling and more than 83% are exposed by toxics substances and become sick and live with long term illness. According to ESDO, recent study and available information, approximately (50,000) fifty thousand children's are involved in the non-formal e-waste collection and recycling process, amongst them about 40% are involved in ship breaking yards.
- E-waste generated from ship breaking yards alone about 2.5 million metric tons of toxics e-waste in a year.
- Bangladesh has generated 10,504 metric tons of toxics e-waste by cell phone sets within last 21 years.
- Every year around 296302 TV sets become scrape and generated 0.17 million metric tons of e-waste.

3.2 Television

ESDO conducted survey in stadium market, the largest market of television amongst 10 importers as sample. Volume of E-waste from Television. In Bangladesh there is no manufacturer of television. They are all assemblers. Basically who are involved in television business either they are importers or retailers or repairers. While surveying, most of the importers introduced themselves as retailers and repairers as well. They do not confess that they are assemblers but varieties of television sets are stored insides the shops though they hang brand name signboards. ESDO's also survey report shows that 8 Importers out of 10, import parts for non-brand television sets. Namely- Walton, My One, Konka, G. Hanzs, Esquire, TCL, Haier from China and Malaysia. 60% assembler assembles these parts in their factories and produce above mentioned local brand sets. The warranties of the most of the TV sets are 5 to 10 years. 8 importers sell around 670 TV sets in a year. 8 retailers, most of the time they sell some unknown television to the customers such as –SMY, Walton, Tristar , Nova, My One China, Esquire, TCL, Haier which are low cost. 20% retailers sell around 1500 TV sets in a year.

E-waste: Bangladesh perspective

Based on the income capacity customers' use non- brand televisions and lifetime of these sets are not more than 3-5 yrs. Most of the time about 60% repairer repair non-brand sets and about 20% repairer repair around 170 brand TV sets in a year. So these non brand TV sets are mainly liable to produce e-waste. About 50% assembler companies are sold out the generated waste, 30% are dumped, 20% are stored for long while. 30% repairers stored the old and damage TV sets for repairer and farther uses, 15% dumps it, 5% didn't want to inform. Among the customers 40% sold rejected sets to the repairers, 10% through away and 20% reuses it after repairing. Survey gives us can easily illustrate the dumping management scenery of total Dhaka city.

When compared with world e-waste disposal on percentage basis, Bangladesh account for 7% annually.

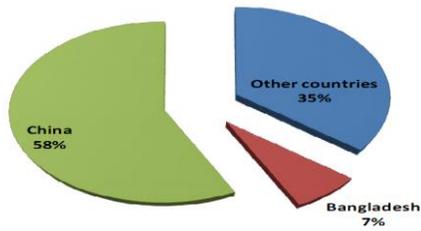


Figure 1. Comparison of e-waste generation in Bangladesh with other countries in the world

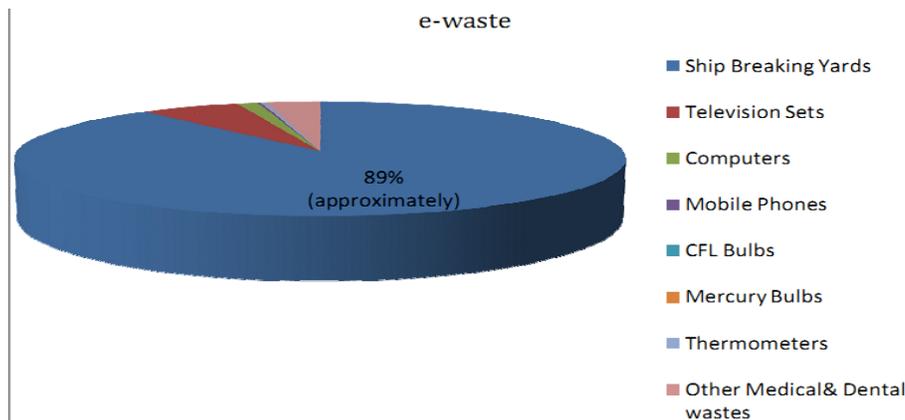
Worldwide disposal of e-waste

The global quantity of e-waste in 2014 is comprised of 1.0 Mt lamps, 3.0 Mt of Small IT, 6.3 Mt of screens and monitors, 7.0 Mt of temperature exchange equipment (cooling and freezing equipment), 11.8 Mt large equipment, and 12.8 Mt of small equipment. The amount of e-waste is expected to grow to 49.8 Mt in 2018, with an annual growth rate of 4 to 5 per cent. Global quantity of e-waste generated:

Year	E-waste generated (Mt)	Population (billion)	E-waste generated (kg/inh.)
2010	33.8	6.8	5.0
2011	35.8	6.9	5.2
2012	37.8	6.9	5.4
2013	39.8	7.0	5.7
2014	41.8	7.1	5.9
2015	43.8	7.2	6.1
2016	45.7	7.3	6.3
2017	47.8	7.4	6.5
2018	49.8	7.4	6.7

Source : Data 2015 onwards are forecasts

Based on yearly generation, the proportion of e-wastes can be shown graphically in percentage with ship breaking yard being responsible for approximately 89% of e-waste disposal yearly.



How Much E-waste Generate

Whether trashed or recycled, what are we getting rid of each year in the U.S.? See next section for what we stockpile.) E-Waste by the Ton in 2010 – Was it Trashed or Recycled (According to the EPA)

<u>Products</u>	<u>Total (Ton) disposed</u>	<u>Trashed (Ton)</u>	<u>Recycled (Ton)</u>	<u>Recycling rate</u>
Computers	423,000	255,000	168,000	40%
Monitors	595,000	401,000	194,000	33%
Hard copy devices	290,000	193,000	97,000	33%
Keyboards and Mice	67,800	61,400	6,460	10%
Televisions	1,040	864,000	181,000	17%
Mobile devices	19,500	17,200	2,240	11%
TV peripherals*	Not included	Not included	Not included	Not included
Total (in tons)	2,440,000	1,790,000	649,000	27%

E-Waste by the UNIT in 2010 – Was it Trashed or Recycled (Same report as above, but reported in UNITS, not by TONS)

<u>Products</u>	<u>Total disposed</u>	<u>Trashed</u>	<u>Recycled</u>	<u>Recycling Rate</u>
	<u>Units</u>	<u>Units</u>		<u>%</u>
		<u>Units</u>		
Computers	51,900,000	31,300,000	20,600,000	40%
Monitors	35,800,000	24,100,000	11,700,000	33%
Hard copy devices	33,600,000	22,400,000	11,200,000	33%
Keyboards and Mice	82,200,000	74,400,000	7,830,000	10%
Televisions	28,500,000	23,600,000	4,940,000	17%
Mobile devices	152,000,000	135,000,000	17,400,000	11%
TV peripherals*	Not included	Not included	Not included	Not included
Total (in units)	384,000,000	310,000,000	73,700,000	19%

3.3 Computer set (Laptop, Desktop etc.):

ESDO conducted survey in IDB Bhaban, the largest market of computer amongst 10 importers as sample. Besides, from some institutions (office, cyber center) information has been gathered to identify the using and reusing rate of computer. In Bangladesh there is no manufacturer of computer. They are all assemblers. Basically who are involved in computer business either they are importers or retailers or repairers.

Volume of E-waste from Computer Up to 1990 the urban population rate of Bangladesh was 18% of total population. In Bangladesh computer was introduced in 1980s. The computer users of that time were urban dwellers. Since the durability of a computer is 3 to 5 yrs, it can be easily said after 1980 to 1990 around 50% computers (estimated) can be counted as rejected sets which had been produced e-waste. So, we can easily guess up to 1990 the volume of e-Assemblers, repairers and customers don't know which heavy metals contain in a television set. And thus they are unaware of e-waste and dumping of it.

Effect of E waste of Computers

E-waste from computer sets was around 100,309. In 2000 the growth rate of urban population was 27%. Naturally computer users and rejected sets rate were enhanced. The volume of e-waste was 399010. Deliberately after 10 yrs i.e. in June, 2010 the volumes of e-waste of computer sets (desktop, laptop) is 1604368. These figures have been counted based on growth rate of urban population and computer users per yearly. So total volume of e-waste from computer set after 80 decades up to current time is 21,03,687.

ESDO's survey report shows that 20% Importers, import non-brand devices of computer set (e.g. Mercury and Havit from China and Taiwan.) Warranties of the most of the devices of the sets are 3 to 5 years. 10% cyber café use mercury brand. 40% assemblers buy different parts of a computer from used computers. 90% assembler buy used computers. After assembling 80% assemblers ensure 1 year warranty of a set. Assemblers buy different devices from used computers and reuse after repairing and ensure warranty for 1 yr. None of the institution under the survey done by ESDO does not buy used computers. Total 60% assemblers dump the e-waste in storage and dustbin and 40% repairer and 50% institution dump e-waste anywhere and everywhere.

3.4 Mobile /cell phone

ESDO conducted survey at Eastern Plaza one of the largest markets of mobile set in Bangladesh, those who introduce themselves as company of mobile sets are basically retailers. They hang signboards in the name of companies namely Nokia, Sony Erickson, and Samsung but inside the shops they keep varieties of sets. Most of the retailers sell the sets of Nokia, Sony Erickson, and Samsung from Singapore, Dubai, Hungary. They also prefer to sell sets from China. They don't distinguish between brand and non-brand sets. Volume of E-waste from mobile phone sets.

In Bangladesh mobile phone was introduced in 1989. There are six companies in Bangladesh. Such as-Citycell, Grameen, Banglalink, Robi, Teletalk(Govt.) and Airtel telecom. From 1990 to 2009 the total subscribers of six companies are 4, 72, 20,000. Till to June 2010 it may be increased 10% of total. Now subscribers are 5,19,42,000. Each subscriber use more or less 2 sets. So total sets will be 10,38,84,000. Since the lifetime of a mobile set is not more than 1 year so, it can be said that in last 10 years sets had been used Assemblers, repairers don't know which heavy metals contain in a computer set. And thus they are unaware of e-waste and dumping of it.

3.5 CFL and Mercury Bulb

The survey among the different customer of CFL bulb to get dumping management system of it. In Bangladesh, CFL bulb set was introduced at least five years back by Transcom Electronics Ltd. Till 2010 the production of CFL by the Transcom Ltd. was 3200000 bulbs. It has been increased 35% of total year to year. The lifetime of a CFL bulb is not more than 1 year to 18 months. Therefore, it can be said that in last 5 years the number of rejected bulbs of Transcom were 5253313 pieces. There are also six other companies produce CFL bulbs in Dhaka city (e.g. Energy pac, Osaka, Anik, Delta, SKS and Rangs.). Both sets (brand and non brand) are warranted for 1 year and especially non brand sets are generating e-waste. According to the census of 2001 the number of household in municipalities were 19,34,000. In last 10 years each household used at least 3 mercury bulbs. So in last 10 years the volume of generated e-waste from CFL and Mercury bulbs is 2428.22 metric ton. To consumers are more or less unknown regarding containing mercury of CFL bulb. 50% of the customers dump the rejected bulbs to dustbin.

Category No. of used mercury bulb 2001 - 2010 (June) (In per unit)

No. of generated e-waste 2001- 2010 (June) (In Metric ton)

Household	1,45,38,10,286.17
Industrial sector	<u>80,02,11,4 1,575.15</u>
Total	94,55,94,21,861.32

3.6 Thermometer

In Bangladesh thermometer is widely used as medical equipment in each household. Especially in urban area more or less each family or household has a thermometer in a year. Since 1971 to 2010(June) urban households are 61,02,95,237. Since the longevity of a thermometer is 1 year, so from 1971 to 2010 about 61,02,95,237 pieces

thermometers have already been rejected after using. So, the volumes of E-wastes are 8513.59 metric tons (10 years). Table-3: Thermometer year Used thermometer (ten years) (In per unit)

<u>E- waste (ten years)</u>	<u>(in metric ton)</u>
1971	3,36,15,120 497.06
1971-81	8,09,20,800 1194.64
1981-91	10,03,09,667 1296.88
1991-2001	16,62,54,182 2357.43
2001-2010	<u>22,91,95,469 3167.64</u>
Total	61,02,95,238 8513.59

3.6.1 Others Medical and dental equipments

The availability and access to health services in Bangladesh is poor and less than 40% of the population receives primary health care. According to the World Health Organization, in 2000 there were just 29,746 doctors in Bangladesh or just one doctor per 4,521 people. (Reference: Country Health Profile, Bangladesh, WHO Regional office for south-east asia, w3.who.sea.org). In 2003, total expenditure on health was just 1.1% of GDP.

The government has made efforts to improve the health system by implementing initiatives such as the Primary Health Care approach, adopted by the Ministry of Health and Family Welfare in 1988. Due to limited government funds, the Primary Health Care system covers just 12 areas, reaching 48 million people which are less than 40% of the population. According to the census report 2001 the registered physician of Bangladesh is 32278. And according to Bangladesh Medical and Dental Council report last 10 years it can be increased 30% i.e. 41961. If each doctor used 10 medical equipments, therefore since 1971 to 2010 medical equipments are used 4,19,610. Since the lifetime of these equipments are not more than 5 years, so last 10 years rejected equipments have been 1,67,844 (estimated) for each doctor. According to census report 2001 government hospitals are 660. So it may be 726 till 2010. Each government hospital uses at least 30 equipments, so till 2010 the number of used equipments was 21780. In last 10 years rejected equipments are 13068. Last 10 years the rejected equipments in private clinics were 12870. So we can say last 10 years in medical sector the volume of e-waste is 1,93,782. In dental sector e-waste may be 5813. In total the volume of medical e-waste is 199595.

According to the survey report of ESDO about 30% doctors, 90% clinic and hospital and 50% dentist dump the e-waste in store. Among the all above mentioned electronic elements most of the e-waste generated from medical equipments with thermometers. The volume of e-waste of it is including thermometer 61,04,94,832.

3.7 Analysis of the findings

From the total working process including data gathering and data analysis, calculation of production of E-wastes in Bangladesh per year can be summarized like this;

Ship Breaking Yard = 2.5 million metric ton/yr (250000 metric ton/yr)

Television = 0.17 million metric ton/yr (26000 metric ton/yr)

Computer = 0.035 million metric ton/yr (35000 metric ton/10yrs)

Mobile Phones = 0.005 million metric ton/yr (10504 metric ton/21yrs)

CFL Bulb = 0.0005 million metric ton/yr (566.90 metric ton/6yrs)

Mercury Bulb = 0.001 million metric ton/yr (1861.32 metric ton/10yrs)

Thermometer = 0.009 million metric ton/yr (8513.59 metric ton/10yrs)

Other Medical & Dental Wastes = 0.09 million metric ton/yrs (93478.25 metric ton/10yrs)

Total= 2.81 million metric tons/yr

Sources: Human Development Report 2006, UNDP, World Health Organization, UNEP, ESDO baseline survey.

According to per year generation, proportion of E-wastes can be showed by the following graphical representation, where it is too clear that ship breaking yard occupied highest position. This sector poses us to be an alarming state. Wastes from television sets have taken the second highest position with an exponentially increasing rate. Figure-1: Graphical presentation of E-waste scenario of Bangladesh (per year)

E-waste: Bangladesh Situation

3.7.1 Overall trend of consumption of electronic goods and disposal practice in Bangladesh and is developing with the increasing of technology usage. Sustainable and safe use of technology can drive an economically developed country. But the wastes from these electronic goods come to us as curse. We consume and dump the useless products without any consideration of environmental benefits and sustainability. From the survey report, it is clear that Bangladesh is improving in IT, media and telecommunication sectors. These lead us to the contamination due to the heavy metals and other hazardous chemicals.

In every year Bangladesh generated roughly 2.8 million metric tons of e-waste. The safe disposal of these products is not being followed strictly and without knowing the harmful effect of the e-waste these have been dumped in to open Soil, farming land and in the open water bodies. Unfortunately the fate of millions of tons of e-waste generated each year is largely unknown. The amount of old electronics or e-waste such as computers, phones and TV's being discarded every year is growing rapidly.

We are creating a noticeable mobile phone density compared to those countries whose economic condition is better off than ours. We can easily guess on the basis of the number of subscribers that there are more than three core mobile phone sets in our country. Average longevity of a set is about one year. So every year we are dumping over one core mobile phone sets. Expectation of the mobile phone companies is to make five core subscribers before the end of this decade. Thus very soon we will dump two and half core mobile phones annually. More than 30 millions of children, women and non-formal workers are exposed by heavy metals lead, mercury, cadmium, zinc and chromium, PCB, Dioxin and furan by these e-wastes.

4.2 Specific Mercury containing product in Bangladesh: Consumer products: Commercial products:

1. Home items: Antiques, barometers, clothes irons, electronics, jewelry, lamps/light bulbs, light switches, paint (Latex), pesticides, security system, shoes, sporting equipment, television sets, thermometers, mirrors, washing machines, calculators, hearing aids, toys, pacemakers, watches, cloth irons, desktop liquid crystal display(LCD) monitor, laptop LCD monitors, neon lights, sewer pipes, sink traps, fire alarm boxes, television sets etc.

2. Medical pharmaceutical products:

Antibiotics, contact lens solution, dental amalgam, sphygmomanometers, ear and eye drops/eye ointment, nasal spray, skin cream etc.

3. Automotive parts:

Convenience light switches, heated car rear windows, some anti-lock braking system.

1. Medical products:

Antibiotics, batteries (medical use),alarms, blood analyzers, sphygmomanometers, pacemakers, pumps, scales, ultrasound, ventilators, gastrointestinal tubes, vaccines, hearing aids.

2. Electric products:

Building security system, fire alarm box switches, laptop LCD monitors, pressure control, light switches, thermometers, generators, sphygmomanometers, computer monitor.

3. Chemical products: Acetic acid, ammonium, chloride, enzyme, sulfuric acid, ethanol

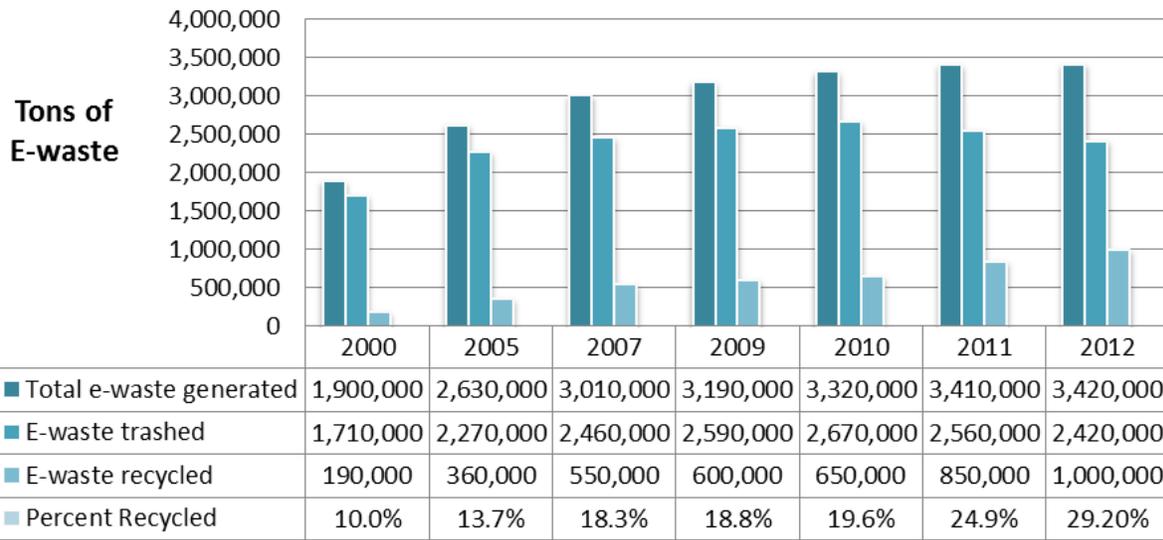
4.3 E- waste concentration areas

In Dhaka the concentration or highest disposal /storage of E-waste are in Islampur, Kamrangirchar, Gingira, Mirpur (Section 11 and section 12) and Mohammadpur etc.

5. Recycling and disposal of E-waste:

The process of recycling in Bangladesh is very injurious and hazardous; there is no proper waste management guideline or regulation. Reuse of e-equipment is a common practice in Bangladesh. E-equipment recycling and dismantling is a growing business. No e-waste dismantling facility in formal sector. All the recycling is being carried out by the informal sector. 120,000 urban poor from the informal sector are involved in the recycling trade chain of Dhaka city. 15% of the total generated waste in Dhaka (mainly inorganic) which amounts 475 tones are recycled daily. Within this amount of waste only 20 to 35% recycled and rest laid in to Soil ,rivers, ponds, drains, lake ,cannels and open spaces.

E-Waste Generation and Recycling 2000-2012



6. Impacts due to the E- waste hazard:

6.1 Environment pollution:

Disposal of these E-wastes without appropriate measures can cause environmental pollution. Lack of awareness or lack of cautionary information for handling or re-using of these expiry products can leave people expose to health hazards. E-waste is threatening the soil contents and causing land less productive to produce crops.

Problems begin if this E-waste dumped in soil if they are dumped illegally. Either the law is not in place or not enforced to take proper disposal measures as well as the lack of system or institutions to monitor the dumping of electronic goods. The country is blessed by many rivers, rainwater is reaching the underground. If the substances dumped are seeping into the soil the aquifer of water can be contaminated with lethal chemicals.

In Bangladesh every year more than 15% child worker died during and after effect of e-waste recycling and more than 83% are exposed by toxics substances and become sick and live with long term illness. According to ESDOs recent study and available information, approximately (50,000) fifty thousand children's are involved in the non-formal e-waste collection and recycling process, amongst them about 40% are involved in ship breaking yards.

- E-waste generated from ship breaking yards alone about 2.5 million metric tons of toxics e-waste in a year.
- Bangladesh has generated 10,504 metric tons of toxics e-waste by cell phone sets within last 21 years.
- Every year around 296302 TV sets become scrape and generated 0.17 million metric tons of e-waste.

6.2 Health hazards: (from e-waste containing mercury, lead, cadmium)

Mercury Lead Cadmium

- *Brain disorders,
- *Kidney, renal and neurological damage,
- *Leading to even death.
- *Learning disabilities,
- *Mental retardation,
- Behavioral problems,
- Hearing impairment.
- Lung damage,
- *Fragility of bones,
- High blood pressure,

- *Nerve and brain damage,
- *Kidney and liver disease.
- *Gastrointestinal Disease etc.

7. Policy Framework:

7.1 Law:

- Bangladesh adopted its National Environment Policy in the year of 1992 highlighting the regulating all activities that pollute and destroy the environment.
- No specific law or ordinance for e-waste management and recycling. But we have Bangladesh Environment Conservation Act, 1995, The Environmental Court Act, 2000, and the Environmental Conservation Rules, 1997.
- The Environment conservation act, 1995 authorize the Director General to undertake any activity necessary to conserve and enhance the quality of environment and to control, prevent and mitigate pollution.
- Medical Waste Management Rules, 2008 addresses the waste management issues for the medical sector including E-waste.
- No regulations specifically dealing with E-waste in Bangladesh.
- Government already prepared draft National 3R (Reduce Reuse and Recycle) Strategy and in that draft e-waste issues were addressed.
- Hazardous Waste Management Rules is under preparation and still time to incorporate E-waste management issues for proper management of E-waste among others.
- The Department of Environment prepared draft solid waste management rules which is now in consultation stage and still time to include E-waste management issues in that rule.
- Bangladesh is a signatory to Basel convention prohibiting trans-boundary movement to hazardous waste.
- Import of any kind of waste requires Government permission.
- The High Court of Bangladesh has directed the Department of Environment to ensure that all ship- breaking yards operating without environmental clearance shut down their operations. The court gave ruling in March'90.
- The High Court also directed the government to ensure that no ship with hazardous wastes enter the country without being pre-cleaned at source or outside the territory of Bangladesh.
- The court observed that none of ministries had co-operated to ensure conformity to the environmental laws. The order said the government had to ensure that ships were only broken after guaranteeing safe working conditions for the laborers and having in place appropriate disposal arrangement for hazardous wastes and protection of environment.

Legal & Regulatory Regime

Authorize the Director General to undertake any activity necessary to conserve and enhance the quality of environment and to control, prevent and mitigate pollution

- Medical Waste Management Rules, 2008 addresses the waste management issue for the medical sector including E-waste.

Legal & Regulatory Regime

Right now no regulations specifically dealing with E-waste in Bangladesh. Preparation of Electrical and Electronic Waste (Management and Handling)

Rules, 2011 is the priority of the Government Bangladesh.

- Government already prepared draft National 3R (Reduce, Reuse & Recycle) Strategy and in that draft e-waste issues were addressed.
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Legal & Regulatory Regime

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•Import of any kind of waste requires Government permission.

Some common features of proposed

Electrical and Electronic Waste (Management and Handling) Rules, 2011

•These rules shall apply to every producer(s), dealer(s), collection centre(s), refurbisher(s), dismantler(s), recycler(s), auctioneer(s) consumer(s) or bulk consumer(s) involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components

8. CONCLUSION AND RECOMMENDATION

Up to this period, no effective measure to stop generating e-waste or strict disposal of this sludge has been adopted. Considering the gravity of the problem following actions may be recommended to mitigate the hazards:

1. Inventory of E-waste in large cities of Bangladesh should be prepared;
2. Develop E-waste policy and guideline in consultation with the relevant stakeholders;
3. Establish efficient collection system at least for selected electronic waste;
4. Registration and capacity development of E-waste recyclers;
5. Introduction of Environmental Management System in E-waste sector;
6. Establish E-waste tracking mechanism in order to update the inventory management;
7. Awareness raising and development of communication materials (poster, leaflets, brochure, TV spot);
8. Monitor e-waste trafficking and shipment in a constant rate.

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