

E-WASTE IN BANGLADESH, ITS CAUSES AND IMPACTS: AN ANALYSIS BASED ON EXISTING REGULATORY AND INSTITUTIONAL FRAMEWORK

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ABSTRACT

Technology has made our life very flexible with new inventions. We, in most cases, solely depend on these technological devices. However, these devices, along with various facilities, have also invited a series of problems mostly due to the lack of proper management. We often leave our electronic devices that went bad or became unusable, in landfills, rivers, drain lakes, canals, and open spaces. As these devices possess a variety of toxic substances, dumping huge amounts of electronic waste can pollute the environment and threaten human health. Around 2.7 million metric tons of e-waste is generated each year in Bangladesh. Only 20/30 of this waste is recycled while the rest amount is released in landfills, rivers, drain lakes, canals, and open spaces posing a serious threat to health and the environment. Bangladesh has experienced rapid advancement in the technological sectors over the years. Therefore, it is a must to take steps necessary for avoiding the future jeopardized situation because of e-waste. The present e-waste management in Bangladesh experiences a number of drawbacks such as challenges in incentivization, unhygienic conditions of informal recycling, insufficient law and policy, less awareness, and lack of enthusiasm on part of the corporate to address the critical issues. In spite of the alarming levels of e-pollution in the country, the concerned authorities are yet to take any effective step or formulate any legislation to prevent the existing e-pollution. Moreover, the prevailing environmental laws are not adequate to address the issue and its application is still largely absent. This paper is an attempt to address causes of e-waste, the existing problem caused by it, analyses the impacts of e-waste on the environment and human beings. Furthermore, this paper will analyze the relevant e-waste policy and its gaps. Significantly, this study will provide few recommendations that can bring an end to the e-waste generation through policy and law. The existing paper makes use of secondary data *i.e.* books, articles, different national and international law reports, Acts, etc.

KEY WORDS: E-waste, Bangladesh, Policy, Strategy and Approach.

INTRODUCTION

Along with rapid economic growth, Bangladesh has an emerging market of electric, electronic gadgets, and home appliances. These demands have increased the production amount of locally produced electronics products also increasing the demand for re-using these products. Equipment is mostly reconstructed and recycled in both semi-formal and informal sectors. These electronic wastes are harmful to human health and the environment. At present, Bangladesh lacks awareness and has

ample information gap on e-waste hazards. E-waste which means the waste coming from electronic and electrical equipment is growing rapidly, as estimation shows 72 billion tons are generated annually worldwide (Alam and Bahauddin, 2015). For sure, the digital evolution has created a massive enhancement in the quantity of e-waste but the use of harmful substances has also changed the quality of it. The massive growth of the electronics and hardware sectors has multiplied the demand for electronics products. Consumers are forced to dispose of their old electronic products as rapid

changes of features in the electronics devices and availability of the improved products are happening overnight. This has increased e-waste at an alarming rate. Bangladesh is also facing the same serious crisis as other countries in the world due to the increasing generation of e-waste. The challenge Bangladesh faces mostly is to create awareness of the environmental, social, and economic aspects of e-waste among the public, consumers, producers, institutions, policymakers, and legislators. It has been observed over the years that a large volume of e-waste is being exported from western countries to Asian countries for disposal. Due to the rising cost of manpower and availability of input materials, it seems that the recycling business in western countries is not capable of running the plant in full capacity. Therefore, western countries are bound to look for alternative destinations for disposal. They look for a place that has a low labor cost and is weak at environmental laws enforcement. E-waste is harmful in nature because it has the presence of toxic substances like Pb, Cr6, Hg, Cd, and flame retardants (Ahmed, 2011). In a developing country like Bangladesh, e-waste disposal mixed with solid municipal waste is creating great environmental pollution. There is no formal recycling technology available and non-formal operators extract precious metals for simply making money. The non-formal units extract metals by dipping a printed circuit board in the acidic/alkaline solutions and heating/burning of PCB. These processes are not only harmful to the workers but also the environment which is a matter of great concern for e-waste management in a developing country like Bangladesh.

E-WASTE: GENERAL CONCEPT AND MEANING

“Electronic waste (E-waste)” is a term that applies to all secondary electronic products such as computers, phone sets/mobile phones, electronic entertainment devices, television sets, refrigerators, whether sold, donated, or discarded by their original owners. E-waste is the short and informal name of the electronic products that go bad or reach the end of their “useful life. Some of the common electronic products are televisions, VCRs, computers, copiers, stereos, and fax machines. A large number of these products can be reused through refurbished or recycled (Babu *et al.*, 2007). Regrettably, electronic discards have become one of the emerging concerns

for our nation. Televisions and computer monitors, audio and stereo equipment, Computers and computer peripherals (e.g. monitors and keyboards), VCRs and DVD players, Video cameras, CFL bulbs, cellular phones, Telephones, and other wireless devices, Video game consoles, Fax and copy machines, Medical and dental equipment etc.

CURRENT SCENARIOS OF E-WASTE IN BANGLADESH

The use of technology in Bangladesh has increased over the years. At present, the sustainable and safe use of technology has become a big concern for the country. The waste from electronic equipment has emerged to be a curse as people throw the useless and unusable products in open places and water bodies without thinking about its impact on the environment and human health. Moreover, Bangladesh imports a significant number of scrap ships legally and illegally each year, and the southern part of Bangladesh is the main destination of these ships used for shipbreaking. The ship-breaking processes leave many heavy metals and toxic pollutants leaked into the environment while oil spills to land and water bodies. Bangladesh cannot but import scrap ships due to some bindings on it, and importers are using illegal channels for making more profit, leaving the country more vulnerable to e-waste. The toxic products and electrical and electronic waste, carried by scrap ships, include electronics, clothes irons, light switches, paint (Latex), pesticides, television sets, antiques, thermometers, washing machines, mirror, calculators, desktop liquid crystal display (LCD) monitors, laptop, neon lights, lamp/light bulbs, sewer pipes, etc. Around 2.7 million metric tons of e-waste are generated in Bangladesh every year. According to the yearly statistics, shipbreaking yards contribute the highest number of e-waste (2.5 million metric tons). On the contrary, the wastes from television sets stand second-highest producing 0.182 million metric tons of e-waste (Chatterjee and Kumar, 2009). It leaves no doubt that Bangladesh has become one of the most e-waste generating countries in the world. But, the country is yet to make any inventory to address the extent of this emerging problem so far. The goods below generate e-wastes in Bangladesh:

- i. In the year of 2006, Bangladesh had a sum of 600,000 personal computers, 1,252,000 television sets, and 2,200,000 refrigerators.

- ii. Two years later, the total number of TV set users increased to 10.3 million in 2008. Around 59, 85,000 TV sets become scrape and generate 88,357.14 metric tons of e-waste per year.
- iii. Bangladesh had a sum of 58.36 million mobile phone users at the end of May 2010.
- iv. Shipbreaking produces around 2.5 million tons of electronic waste each year.
- v. In the last twenty years, the country received 10,504 metric tons of toxic e-waste by cell phone sets.
- vi. The information and telecommunication sector has also generated 35,000 metric tons of e-waste in the last 10 years.
- vii. Mobilephone users have sharply increased in Bangladesh over the years. Mobile phones have become one of the fast-growing market sectors in the country. Bangladesh has a huge number of active mobile phone users. Probably the country has more than three core mobile phone sets. As the average longevity of a mobile set is about one year, the country is getting over one core mobile phone set as e-waste per year.

E-Waste: Impacts on Health, Environment and Human Rights Concern

Merging human rights with environmental problems creates a mutual standpoint for the people who are affected by it. This process creates a right-based platform for environmental safety. However, it puts the affected people at the core of this matter. Intellectuals from all over the world came to this conclusion after various researches. Most of the people who come to this mutual standpoint are either affected by environmental crisis or pollution. This enunciation of human rights makes some openings to achieve the rights for the affected people. It plays an important role both in overseas and local areas to get the appropriate justice through an authorized process. The most affected part of the community to this environmental crisis has something to gain from this judicial process. It may soothe their scars at least by gaining some political support. Human rights and environmental ruins have a reciprocal relationship. It's like the two ends of a rope. Sometimes, exploitation of human rights can create an environmental disaster. On the other hand, at times, environmental collapse can manipulate human rights too. The world is getting wrapped by the wire of technology. One of the most dangerous causes of environmental pollution is electronic waste. It's a slow poisoning but certainly

kills. There are numbers of electronic wastes and thousands of particles that are merging into our earth every second and making the environment hostile. These electronic wastes come in the form of metals or chemicals. Mercury, lead, cadmium, chromium, magnetic properties, and antimony (flame retardants) are examples of heavy metals or chemicals, which include polybrominated biphenyls, polyvinyl chloride, polychlorinated biphenyls, and polybrominated diphenyl ethers. One of the deadliest elements of digital wastes is the mercury-made items, namely batteries, electronic circuit boards, and CRTs (Gibson and Tierney, 2006). Besides, there are certain plastic wastes that carry brominated flame retardants and it is one of the major concerns for environmental pollution. Sometimes, mishandling of these serious components during the waste management process may lead to catastrophe. If one of these highly sensitive substances somehow outflows or merges into the atmosphere then it may cause serious damage to the surroundings. Reports say, mismanagement during waste dumping, continuously affecting our soil, food, and nearby water reservoir and lives in it. The experimental observation took place at the shipyard of Chittagong in Bangladesh. It exposed that the soil of that area was contaminated by the excessive appearance of various chemicals such as cobalt, arsenic, selenium, cadmium, antimony trioxide, and chromium (Sthiannopkao and Wong, 2012). There is another major concern regarding this waste management system. Most often, these electronic wastes are burnt which makes the air toxic and paves the way for a new environmental crisis. Not only these electrical wastes pose a threat to environmental ruins but also create substantial risk for the human body. Workers at the electrical waste disposal plants suffer from various diseases. Research shows that people who work in electrical waste plants are more likely to suffer from nausea, headache, and respiratory complications. It is not wise to say that the people who only work inside the waste dumping plants suffer from these complications rather the whole neighborhood is highly affected by this environmental hazard. However, these contaminate the soil, food, and rivers and indirectly make the environment hostile for living. Most often, people who deal with electrical waste are found consuming waste particles inside their bodies, mostly through dust inhalation and dietary intake. These electronic wastes can lead to serious damage to health such as

upsetting the nervous system, causing brains to function imperfectly, damaging kidneys and liver, and also could make newborn babies suffer serious birth defects (Kojima *et al.*, 2009). The main reason behind e-waste pollution is the lack of an appropriate disposal system. Most people do not know how to handle these sensitive products and this can lead to hazardous scenarios. One of the major concerns about this e-waste is its illegal or unsafe dumping into the land which can significantly damage the fertility rate of or land resulting in less production of crops. The problem is identified vividly but either the authorities are not taking necessary measures to make sure our environment is as safe as it is possible or the law that exists to ensure the proper disposal of this waste is not good enough to change the scenario. Geographically, this country has a huge advantage as it has many rivers and frequent rainfall. However, if the deadly chemicals from the waste can make their way to the underground water reservoir once, the blessing could turn into a curse in a moment.

RECYCLING AND DISPOSAL OF E-WASTE

Due to the lack of proper waste management policy and guidelines, the practice of recycling in Bangladesh has become very complicated, sometimes injurious, and hazardous. In Bangladesh, the reuse of e-equipment is a regular phenomenon. Rather, the recycling and dismantling of e-equipment have turned into an emerging business. As Bangladesh has no e-waste dismantling facility in the formal sector, all the recycling is being carried out by the informal sector. In the recycle chain of Dhaka city, the capital city of Bangladesh, there is 120,000 urban poor from the informal sector. Around 475 tons (15 percent of the total generated waste in Dhaka city) are recycled per day while the rest are dumped into landfills, rivers, ponds, drains, lakes, canals, and open spaces.

Current Policy And Legislation Gaps Regarding E-waste

National Environmental Policy was adopted by the Bangladesh government in 1992 for the regulation of all activities that pollute and destroy the environment. Later, the government formulated the Environment conservation Act, 1995, with a view to regulating, conserving, and enhancing the quality of the environment and controlling, preventing, and reducing pollution. The Medical Waste Management

Rules, 2008 only address the waste management issues for the medical sector including E-waste (Dana, 2011). The latest initiative is Electrical and Electronic Waste (Management and Handling) Rules, 2011 which has the following features: These rules apply to every producer(s), dealer(s), collection center(s), refurbished(s), dismantler(s), recycler(s), auctioneer(s) consumer(s) or bulk consumer(s) involved in the manufacture, sale, and purchase and processing of electrical and electronic equipment or components. It defines responsibilities of the producer, Responsibilities of dealers and Responsibilities of refurbishes, Responsibilities of collection centers, and Responsibilities of consumer or bulk consumer, Responsibilities of dismantler, Responsibilities of recycler/preprocessor.

Department of Environment (DoE) is the first body established in Bangladesh in 1977 under the Environment Pollution Control (EPC) Ordinance, 1977 for the protection of the environment followed by the Ministry of Environment and Forest. Later, the National Environment policy came into effect in 1992 which includes the regulation of all activities that pollute and destroy the environment. The Environmental Protection Act (ECA), 1995 subsequently allows DoE to undertake any action that is appropriate for maintaining and enhancing environmental quality and for controlling, avoiding, and reducing pollution (Bangladesh Environmental Protection Act, 1995). The Act also authorized DoE to provide clearance on environmental issues for any new project. In compliance with the subsequent rules under ECA, the Environment Conservation Rules, 1997 differentiates industries and projects into various groups considering their pollution load and possible impact on the environment. Though some provisions and obligatory rules urge for building a waste management system within industry sectors, none of the act and rules covers e-waste. However, the government is planning to formulate a solid waste management policy that may cover e-waste. Meanwhile, the Medical Waste Management Rules, 2008, covers only waste management issues for the medical sector, including e-waste.

For Bangladesh, the development of policy related to e-waste including waste reduction initiatives such as Extended Producer Responsibility (EPR) can be very fruitful. This legislation provides Bangladesh with the policy framework to deal formally with e-waste problems as well as to quickly control the lessons learned in e-waste legislation and management from developing countries. However,

implementation of e-waste policy can also be disadvantageous if it is implemented by developing countries without applying it to local socio-economic circumstances and challenges.

National Environment Policy was adopted in 1992 to protect the environment. However, no particular law or ordinance is available at present for e-waste management and recycling in the country. Bangladesh has several acts and rules such as The Environment Conservation Act, 1995, The Environmental Court Act, 2000, and The Environmental Conservation Rules, 1997. The Environmental Protection Act, 1995 subsequently allows DoE to undertake any action as it seems fit for maintaining and enhancing environmental quality and for controlling, avoiding, and reducing pollution. The government has already drafted National 3R (Reduce Reuse and Recycle) strategy where e-waste issues have been addressed. The following rules—Hazardous Waste Management Rules and Solid Waste Management Rules are under preparation. As both of the rules have not been finalized yet, there is still a chance to include the E-waste management issues in them. Bangladesh has signed the Basel Convention prohibiting trans-boundary movement to hazardous waste. Government approval is required for any kind of waste import. The Supreme Court of Bangladesh has also issued directions to the Department of Environment to ensure that all shipbreaking yards operating without clearance from the DoE shut down their operations. The apex court has also asked the government not to allow any ship with hazardous wastes to enter into the country without being pre-cleaned at the source or outside the territory of Bangladesh. The court has also found the lack of cooperation from the concerned ministries for ensuring conformity to the environmental laws. It further orders the government to ensure that ships are only broken after safe working conditions are guaranteed for employees and proper recycling arrangements are placed into place for hazardous waste and environmental safety.

CONCLUSION

Bangladesh is yet to take any effective step to put an end to generating e-waste or proper disposal of this sludge. Following actions could be taken as part of the way forward:

i. Identifying and creating a reservoir of E-waste in large cities of Bangladesh

ii. Formulation of applicable e-waste disposal regulations and guidelines with consulting the concerning stakeholders.

iii. Establishment of efficient collection manuals for selected electronic waste.

iv. Introduce registration as well as efficiency improvement programs for E-waste recyclers.

v. Introduction of Environmental Management System in the E-waste sector.

vi. Establishing E-waste tracking a mechanism so that the inventory can be kept updated.

vii. Raising Awareness through the development of communicative materials i.e. posters, leaflets, brochures, TV spots etc.)

viii. Supervision of e-waste trafficking and shipment in order to serve the purpose.

At present, solid waste management has become one of the biggest challenges for Bangladesh. The emergence of e-waste has also fueled the problem urging to assess. A detailed assessment of the present and future scenario of the e-waste and its management including quantification, characteristics, existing disposal practices, environmental impacts, etc. is a must for now. Institutional infrastructures, including e-waste import, collection, transportation, treatment, storage, recovery, and disposal, need to be established, at national and/or regional levels for the environmentally sound management of e-wastes. The establishment of e-waste collection, exchange, and recycling centers should be encouraged in partnership with private entrepreneurs and manufacturers. E-waste policy development may require a paradigm shift in perception from a problematic waste issue to an opportunistic green growth solution for Bangladesh. Consequently, the e-waste policy development may require a more customized approach where instead of addressing e-waste in isolation it should be addressed as part of the national development agenda that integrates GEA and SEA as part of national policy planning.

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