

BANGLADESH

**Business Models' Compliance of Electronic Goods
Manufacturers with Environmental Sustainability and the
*E-waste (Hazardous) Management Rules 2021***

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EXECUTIVE SUMMARY

Electronic waste (e-waste) becomes a major concern in regard to the environmental sustainability. According to a UN report, 52.7 million tons of e-waste was generated in the world in 2020 of which only 17.4 per cent was recycled. It added that the amount of e-waste will be increased to 72.8 million tons in 2030. Asia is leading in producing the highest amount of e-waste - 24.9 million metric ton (MMT) in 2019 - in the world while Bangladesh contributes 7 per cent of the total e-waste annually in the world, a recent news report says. A Department of Environment report says Bangladesh produced 400,000 tons of e-waste in 2018 and a BUET study says it will reach to 4.62 million tons by 2035. The growth rate of e-waste generation in the country is estimated at 15 per cent by 2025, the report says. The country only recycles 3 per cent of its generated e-waste currently as a BUET study says.

Unfortunately, the public and the concerned businesses are not aware about the concomitant environmental hazards of e-waste. They do not have any policy to take back damaged and non-operational electric, electronic and household appliances from the consumers they produce and/or sell. The government only in 2021 adopted the Hazardous Waste (e-waste) Management Rules which has not yet implemented at the manufacturers and consumers' levels. Municipalities and city corporations of the country do not have any system and process yet to segregate and proper management of dumped e-waste. People usually dump the discarded e-waste materials to the dust bins, drainage system or into the water bodies randomly.

With proper technical know-how, infrastructure and system, e-waste may be made into a profitable business amounting to US\$ 221 million in Bangladesh as the BUET study suggests.

A study was conducted to see the existing scenario of the business models of respective companies whether they undertake proper initiative to ensure environmental sustainability. The study also assesses the severity of hazards creating by e-waste in Bangladesh, highlights the legal regimes and its implementation. It also comes with a set of recommendations proposing a way out from the prevailing hazardous condition created by high rate of e-waste generation in the country.

It is found that the industry people and the public are not aware about the recently adapted Hazardous Waste (e-waste) Management Rules, 2021 and its implementation or practice. Monitoring of e-waste management processes, if any, of the industries by the concerned departments of the government is not being done as it found. There is no specific formal business model of e-waste practised by the concerned industries but only some in the informal sector with little effect.

The study recommends that the concerned industries, local government, and the consumers should be made aware on the hazards of e-waste while the government can undertake appropriate measures to do that. Its proper management should be ensured implementing the existing laws, especially the Hazardous Waste (e-waste) Management Rules, 2021. An effective business model needs to be established taking all the stakeholders on board, especially the respective industry people and the informal sector.

With proper management, legal regimes and appropriate business model in practice, e-waste may become a resourceful source of incomes rather than hazards. Strong will and proper commitment can ensure environmental sustainability in Bangladesh.

INTRODUCTION

E-waste is extremely dangerous for environment, human health and living beings. It contains chemicals such as lead, mercury, copper, cadmium, beryllium, barium etc., that contaminate earth, air and water. In summer, they get even worse in the heat wave damaging atmosphere. Lead is one of the most poisonous elements in e-waste which badly impacts blood, kidney, central and peripheral nervous systems.

E-waste contributes to increasing prevalence of diseases such as cancer, nervous breakdown, asthma, hearing and visual problem, kidney and brain disorders, liver and lung damage and increased rate of infant mortality. (Raha, 2021)

“There are some 32 separate heavy metals including lead, chromium, cadmium and copper and plastic additives that are found in e-waste, and 18 of them can directly enter the human body through the food chain and people can develop diseases like cancer.” (Sakib, 2022)

A global alliance working on e-waste, Global E-waste Statistics Partnership (GESP), reports e-waste is increasing by 21 per cent per year globally. In 2019, 53.6 million tons of e-waste was generated in the world. Only 17.4 per cent of the e-waste was reused in that year. (Ahmed, 2021) A UN report says, the world created 52.7 million ton of e-waste in 2020 which is estimated to be increased to 72.8 million tons in 2030. (Acharya, 2022)

The World Health Organization says that 12.9 million women are engaged in informal e-waste sector. These women and their upcoming children may be harmed by the poisonous e-waste. They are also saying that the high amount of poisonous chemicals such as mercury and lead in the e-waste materials can enter into children’s body very easily and development of their

intelligence may be stunted as a consequence.

Bangladesh creates 7 per cent of the total e-waste annually in the world. A Department of Environment (DoE) report mentioned 8 types of electrical and electronic products were produced in Bangladesh in 2018. It said, 400,000 tons of e-waste was generated in the country in that year out of which only 3 per cent was recycled and the rest was thrown away randomly. A BUET study projected that the volume of e-waste in Bangladesh will be around 4.62 million tons by 2035. It says that the generation of e-waste is increasing by 20 per cent annually in Bangladesh. The growth rate of e-waste in the country is estimated to 15 per cent increase by 2025. It generates about 2.81 million metric tons of e-waste and the most of it is thrown into water bodies or put under soil. (Hossain, 2022)

A proper e-waste management and recycling procedure are not in place in Bangladesh. This is done mostly in the informal sector by the small businesses. They take out reusable materials and sell to manufacturing companies and the rest are dumped either in the landfill, water bodies or into the drainage system. Rising amount of e-waste degrades environment and thereby human, animal and marine lives are facing health hazards and long-term illnesses. A report says about 15 per cent child workers die in the country and 83 per cent of them are in touch with toxic materials suffering from diseases. About 40 thousand children are engaged in e-waste processing works of whom 40 per cent is working in the ship breaking industry of the country.

Department of Environment, Bangladesh made the Hazardous Waste (e-waste) Management Rules, 2021 on June 10, 2021 under Bangladesh Environment

Conservation Act (BECA), 1995. This is the beginning of formal e-waste management policy in the country to make e-waste producers comply with. It imposes obligations to the manufacturers, assemblers, recyclers, sellers and consumers of electronic, electric and home appliance products. The Rule sets that its violation is liable to punishment to incarceration, fine or both. But these are not yet implemented.

E-waste contains heavy metal, silica, polyester, phenol, formaldehyde, halogenated polymer, nitrogen-containing polymer etc. It consists of 60.2% metal, 15.2% plastic, 5% metal-plastic mixture, 12% tube and screen, 2% circuit board and other thing. (Roy, Islam, Haque, & Riyad, 2022)

Bangladesh creates almost 7% of the total e-waste in the world every year. (Raha, 2021) Bangladesh generates 3 MMT e-waste per year which is being increased due to the government's 'Digital Bangladesh' programme. (Roy, Islam, Haque, & Riyad, 2022) The rate of increased e-waste generation in the country is 33 per cent in the last 10 years. (Raha, 2021)

Mobile phones contribute to 10.5 tonnes of e-waste and television sets contribute 170,000 tonnes in the country. Only 3% of the e-waste of the country is recycled currently. (Roy, Islam, Haque, & Riyad, 2022). In Dhaka and Chattogram cities combined only 20% to 35% of the generated e-waste is recycled. (Raha, 2021)

Unrecycled e-waste materials are dumped randomly into landfills, drainage system or water bodies which creates severe health issues, especially for the children. It is also reported that rate of infant mortality among the neighbours of a recycling e-

waste site is very high, 36.3 per cent. (Raha, 2021)

Systemic recycling of e-waste materials may be a profitable business model. It may be a business of US\$ 221 million in Bangladesh. (Roy, Islam, Haque, & Riyad, 2022) Knowledge and skills need to be enhanced to realise the potentials from e-waste business.

The issue of e-waste as a source of hazardous chemicals was first come into focus through the medical waste management guidelines. Bangladesh Environment Conservation Act was adopted in 1995 and the Hazardous Waste (e-waste) Management Rules was made in 2021. It delineates obligations for the manufacturers and business entities of electrical and electronic products as well as the recyclers and consumers. Punishments for the violators of the Rules are also inscribed in the document.

Unfortunately, awareness about e-waste is not well publicized and implementation is still lax. The Ministry of Environment and Forestry (MoEF) does not have required human and technical resources at its disposal to monitor necessary activities related to e-waste management and implementation of the respective Rules. Dhaka City Corporations do not possess necessary infrastructure and facilities to segregate e-waste and its proper management.

OBJECTIVES AND METHODOLOGY

Objectives

The specific objectives of the study are:

Examining existing business models' compliance of the of the electronic goods manufacturers to the environmental sustainability in Bangladesh. The objective of the study is also to look into the companies whether they comply with the E-waste Management Rules, 2021 to ensure environmental sustainability. It also highlights legal regimes and implementation of the Rules.

Methodology

To conduct the research, a number of methodologies were followed. Dhaka city was selected as the location to conduct the study. Primary and secondary data was collected in two main procedures and triangulated for drawing the analysis and recommendations. Data collection procedures include:

- a. *To realize the objectives of the study, desk research and literature review were conducted in the area of e-waste policies and practices*

- b. *Key interview was conducted to the key electrical, electronic and household appliance businesses and industries in Dhaka many of whom have countrywide operation.*
- c. *A survey was conducted with the respective industry leaders in Bangladesh with specific questionnaire. Nine companies have been selected based on their size, popularity and market share of the products i.e., computer, laptop, mobile phone and television, in the country. The survey focused only on the popular and most used electronic and electric goods and the most influenced and popular brands or companies in Bangladesh.*
- d. *Seven big computer, mobile phone and electronic companies operating in Bangladesh have been interviewed. All of them import, sell and provide services to their sold products, mainly computer, laptop and accessories. Two big manufacturing company of the country engaged in electronic and home appliances business have been interviewed.*

Limitations of the study

There are hundreds of small and big companies of who only seven big computer hardware businesses and mobile handset manufacturers and two popular electronic home appliance manufacturing companies were interviewed for this study to understand their awareness regarding Hazardous Waste (e-waste) Management Rules, 2021 and e-waste processing, business model, management and reporting system, if any to ensure environmental sustainability. The interviewed companies are based in Dhaka city but many of them operate countrywide and many others also remain outside Dhaka. The study tried to understand and assess existing situation of e-waste hazard management with a limited scope.

EXISTING LEGAL REGIME: E-WASTE MANAGEMENT RULES 2021

Based on the Environment Conservation Act, 1995, the Government of Bangladesh enacted Hazardous Waste (e-waste) Management Rules, 2021. Major binding rules from the document are given below as a ready reference for the readers.

Manufacturers, traders, sellers, transporters, repairers, collection centers, recyclers, dismantlers, etc. of the subject products are required to register with a prescribed form to the Department of Environment (DOE). When applying for registration, they shall also submit an e-waste management plan.

Registered manufacturers, recyclers, etc. shall obtain environmental clearance in accordance with the Environmental Conservation Rules, 1997.

Manufacturers have to establish individual or joint collection centers and set aside funds for the management of e-waste.

For fluorescent lamps and mercury incandescent lamps, if they cannot be recycled, they need to be handed over to collection centers for storage and disposal.

No e-waste can be stored for more than 180 days and old or used electrical and electronic products cannot be imported.

Manufacturers, importers, etc. shall meet the collection targets for e-waste as specified in the Schedule (10% in the first year of the implementation, 20% in the second year, 30% in the third year, 40% in the 4th year, and 50% in the fifth year and thereafter).

In order to facilitate proper management of e-waste, the name, address and contact information of the trader or seller as well as the information on the registered collection center shall be displayed on the product or on the product label, or this information shall be provided to consumers or large consumers.

Traders, sellers and collectors of e-waste shall receive them from the consumers in case of violation of the provisions of these rules, the offender shall be liable to imprisonment for a maximum period of two years or to a fine of up to Taka two hundred thousand, or both, in accordance with Section 15(1) of the Bangladesh Environmental Conservation Act, 1995. In case of repeating offenders, they shall be punished with imprisonment for a term ranging from two to ten years or a fine ranging from Taka 200,000 to Taka 1,000,000 or both.

Very recently, Bangladesh Telecommunication and Regulatory Commission (BTRC) issued direction for telecom equipment producers, manufacturers, assemblers and importers. This is the first of its kind in the country. The telecom e-waste producers require maintaining Hazardous Rules 2021 and additionally, they have to comply with the Guidelines related to Telecom E-waste Management and Recycling System. All BTRC licensees must follow the guidelines. The telecom equipment including mobile phone handsets manufacturers and assemblers must submit detailed reporting in every six months of their e-waste to BTRC. BTRC also will award licenses to interested firms for telecom e-waste recycling and management.

FINDINGS FROM THE SURVEY

Information Technology:

The biggest tech companies engaged in importing, selling and services of computers, mobile phone handsets and laptops do not formally have business model compliance to the E-waste Management Rules 2021 in practice. Many of them are not aware about the Rules though they know about the environmental impacts of random disposal of the damaged or out-of-service electronic products.

Half of the surveyed companies have very limited scale of e-waste recycling and storage facilities which are much smaller in capacity and size than their production capabilities.

They only sell brand new products as well as they provide warranty and repairing services of old products but they never receive products for recycling or disposal. If the products are out-of-service within the warranty period, they return them to the mother company i.e., the companies they have imported from, mainly based in China.

They do not receive totally damaged computers and laptops from the customers. They do not know how the customers dispose of the products, may be, they sell those to small scrap business people or dispose them in the dustbins.

Television, mobile phone and electric household appliance:

As regards the electronic and household appliance companies, we interviewed two big companies engaged in manufacturing, selling and servicing television, mobile phone, air conditioner, refrigerator, washing machine, fan and other items.

It is found from the survey that these companies only receive, recycle or dispose television, air conditioner and electric fan. They have central storage facilities in the suburban areas of Dhaka city. They have exchange policies of out-of-order products of these three items only. They never receive other out-of-order products. They provide only warranty or servicing sold products within the agreed periods only. They never receive totally out-of-order products and expired products other than only the mentioned three products.

Most of the staff of these companies is not aware about the Hazardous Waste (E-Waste) Management Rules, 2021. It is found that the respective government officials seldom visit them for monitoring environment and e-waste management compliance purposes.

Some Key findings of the study

- *In general, the officials of the interviewed companies are not aware about the recently adopted Hazardous Waste (e-waste) Management Rules, 2021.*
- *Monitoring of the e-waste processing and management of the companies is not conducted by the respective government agencies on a regular basis.*

- *The computer hardware, electronic and home appliance businesses and manufacturers do not take responsibility of environment friendly e-waste processing and management.*
- *The interviewed companies do not have any declared business model and sustainable e-waste management system though they have marketing policy.*
- *The companies have no recycling factories though some of them send the devices for recycle in a limited scale and some burn the devices in the open field.*
- *The interviewed companies also said that e-waste should be managed by the city corporations and municipalities.*
- *The interviewed officials said they are ready to participate in e-waste management and recycling process actively with financial contributions if the government takes initiatives.*
- *They said PPP model recycling plants may bring all stakeholders together involving local governments, specially city corporations.*
- *The companies said that e-waste management becomes a huge concern for them to storage and manage.*

BUSINESS MODELS' COMPLIANCE TO THE E-WASTE MANAGEMENT RULES

“E-waste is not waste but a resource if we can manage it properly. Valuable and necessary materials from these obsolete products can be collected through proper waste management,” said Rowshan Momtaz, Professor, Civil Engineering, Bangladesh University of Engineering and Technology (BUET). (Sakib, 2022)

With proper planning, know-how, capacity building with necessary infrastructure, effective and profitable business model may be established for e-waste collection, processing, recycling and even exporting.

An example has already been set by Azizu Recycling and E-waste Company at Delpara, Fotullah, Narayanganj. They are running its business since 2013.

If 100 per cent products require proper recycling, there must be involvement of government through local government bodies including union parishad, municipalities and city corporations. They have capabilities to reach everywhere to collect, manage and recycle the e-waste.

Consumer recycling behavior is also key and essential for implementing an efficient e-waste recycling model since proper return of expired products, through formal collection channels, allows using the potential of circular business models. Convenient and adequate collection infrastructures and economic incentives are required to ensure a high-level consumer involvement in e-waste collection.

The existing rules, regulation regarding e-waste do not mandate companies to offer lucrative incentives for collecting expired goods. The rules must include the incentivized return policies as well.

The electronic goods manufacturer companies though not have any established business models for e-waste management; however, they are somehow linked with the informal sector like large scale dealers and e-waste recycling factories where sometimes they send their obsolete devices for recycling.

There are mobile vendors who collect electronic devices from the households, offices and dumping grounds and they sell those collected goods to the small scale and large-scale dealers and to a certain extent to the companies though many companies do not have enough storage facilities. Dealers usually send the devices to the recycling factories and the recyclers make new goods and sell to the market.

The informal recycling business model in effect now is given below-



RECOMMENDATIONS

- *Raising awareness of the manufacturers, sellers, businesses, service providers, recyclers and the consumers of electronic and electrical products about Bangladesh Environment Conservation Act, 1995 and Hazardous Waste (e-waste) Management Rules, 2021 is the need of the hour.*
- *Effective implementation of the Act and Rules need to be ensured.*
- *Necessary human and technical resources and technical know-how should be mobilized and facilitated.*
- *Proper collection, processing and management system of e-waste need to be in place.*
- *The City Corporations and municipalities of the country need to be equipped with necessary facilities and resources to process and manage dumped e-waste.*
- *Non-government development organisations may be engaged in raising awareness of the stakeholders as well as facilitating e-waste management processes.*
- *Funds for conducting research and studies on e-waste management need to be allocated to innovate new technology for environment friendly disposal and extraction of reusable materials from the e-waste.*
- *A separate site or region may be designated for e-waste materials processing and disposal.*
- *A countrywide survey to assess the amount of e-waste generation, processing, recycling and disposal system should be conducted.*
- *Capacity of the concerned departments of the government should be strengthened and a formal monitoring and reporting system of e-waste collection, processing, recycling needs to be initiated.*
- *Establishing e-waste treatment plant on public- private partnership (PPP/ Non-profit basis) initiative may result in engagement of all stakeholders in the process. Producers may be registered with the recycling agencies and treatment plants for paying the recycling cost. Treatment cost might be shared by producers and consumers. It can also be based on profit. But some control should be established as profit making opportunities might lead towards early recycling and inefficient utilization of resources.*
- *The government may take a number of pilot projects, especially in divisional headquarters, on PPP basis to see the effectiveness of this model.*
- *Efforts need to be made to acquire technical know-how, maybe from the developed countries, to recycle and management of e-waste.*
- *All the stakeholders, especially concerned industries need to be made into establishing a recycling industry of the e-waste.*

Conclusion:

Overall situation of e-waste is severe in Bangladesh. It's one of the largest producers of e-waste given its size of population, increased urbanization, rapid increase of

educated population and adoption of digital technology and infrastructure along with the government's programme of Digital Bangladesh. On the other hand, the stakeholders, especially the concerned businesses, entities and the public are not at all aware about the severity of the situation of e-waste hazards and its concomitant

consequences to human and aquatic lives and environment. To mitigate the situation, necessary corrective measures along with full utilization of currently available legal provisions, technical know-how, human, logistical and institutional facilities should be ensured.

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