E-Waste Management in Bangladesh: Governance Challenges and Way Forward

(Executive Summary)

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Electronic waste (e-waste) is electrical and electronic equipment discarded by users due to lack of use or when it has reached the end of its usable life. It encompasses various electronic devices such as telecommunications and information technology equipment, large household items, lighting equipment, medical devices, monitoring and control devices, consumer electronics, electrical tools, sports and leisure equipment, toys, mobile phones, and computers. According to the Global E-Waste Monitor 2024, a record 62 billion kg of e-waste was generated globally in 2022, equivalent to an average of 7.8 kg per capita per year. E-waste moves through multi-party and multilayer distribution systems, making the management system highly complex. Recycling e-waste is crucial for recovering valuable materials and reducing the environmental and health impacts of improper disposal.

Managing e-waste in Bangladesh presents enormous challenges, given the country's large population and the lack of necessary infrastructure. Currently, no centralized data is available on e-waste generated and recycled in the country. Few studies show a wide range of annual e-waste generation: from 170 million kg to 600 million kg in 2021. Informal businesses manage most of the e-waste generated in Bangladesh. Despite the enactment of the Hazardous Waste (E-waste) Management Rules (2021), no improvement has been observed in the country's overall e-waste management. According to the rule, electronics and electrical equipment producers are held accountable for collecting e-waste for recycling or disposal, with a collection target of 10% in the first year and increasing to 50% by the fifth year from the start date of the rule's implementation. With the rule entering its fifth year, it is an opportune moment to analyze the governance challenges of e-waste management in Bangladesh.

This report aims to identify governance challenges and provide specific recommendations to address them. It highlights the sector's development following the issuance of the Hazardous Waste (E-Waste) Management Rules (2021). The main objectives include identifying issues in the regulatory framework for e-waste management, assessing stakeholders' compliance with legal obligations, emphasizing the connection between e-waste management and climate change, and proposing solutions to the identified challenges. The e-waste governance system was analysed using six indicators of good governance: compliance with laws, coordination, transparency, accountability, corruption and irregularities, and participation. A mixed-methods approach was used, involving document review, in-depth and key-informant interviews, surveys (both online and on-site), observational verification, and estimation.

Inconsistencies in relevant regulations, policies, orders, and international commitments

To date, only seven recyclers have obtained registration under the Hazardous Waste (E-waste) Management Rules. However, hundreds of e-waste businesses in the informal sector primarily collect e-waste. Unregistered informal e-waste businesses do not comply with rules, putting workers' health at risk and harming the environment. The Hazardous Waste (E-Waste) Management Rules (2021) do not guide environmentally sound management for the informal

sector, despite the sector's businesses dating back decades before the rules were enacted. Electric vehicles, solar panels, battery-operated toys, drones, and similar items are not covered under the current regulations. The rules make vague references to incentives, fines, and other penalties. Occupational health and safety requirements are only mentioned in one sentence, which is inadequate for effective implementation. There is no provision for managing e-waste from the shipbreaking industry, and even the Bangladesh Ship Recycling Rules (2020) lack specific guidelines on this. Although the import of old electronics is prohibited, there is no policy regarding the sale or use of old electronics from the shipbreaking industry. On the other hand, export conditions under the Basel Convention are not mentioned in the rules – a loophole exploited by exporters in the absence of enforcement and penalties.

Lack of coordination among government agencies

A clear example of a lack of inter-agency coordination is that seven organizations are registered with the Department of Environment (DoE) for e-waste management. In contrast, under the Bangladesh Telecom Regulatory Commission (BTRC), 14 organizations are registered to handle telecom e-waste. Although seven organizations are registered with both agencies, the remaining seven operate without registration with the DoE. Due to the lengthy nature of meetings at both government agencies and the difficulty of coordinating the schedules of other law enforcement agencies, formal registered recyclers must wait a long time to dismantle e-waste lots. The number of meetings held to issue NOCs has increased in recent years, but it still takes an average of 1.5 months to hold these meetings. Formal recyclers have to incur storage costs while waiting for the joint No Objection Certificate (NOC), which affects their turnover. There are also delays in arranging meetings to obtain the Prior Informed Consent (PIC) required under the Basel Convention for the export of e-waste. Since the DoE issues the PIC certificate directly to the exporter, customs authorities cannot verify its authenticity. There is also no integrated e-waste management action plan between the DoE and the local government institutions, such as the city corporations and municipalities.

Lack of accountability

The ongoing presence of informal businesses involved in e-waste storage, shredding, and dismantling indicates that the DoE is not fully committed to enforcing e-waste management rules. The DoE has failed to take any visible, effective measures to register producers, importers, or distributors of electrical and electronic equipment. As a result, four years into the implementation of the e-waste management rules, there is still no clear way to track progress toward the collection targets: 10% within the first year and 50% within five years. Meanwhile, this study reveals that the so-called informal actors in e-waste management are not truly informal; most hold trade licenses or other business registrations. These actors operate outside the DoE's radar but are known to other government agencies. Although they are essential for diverting e-waste from landfills, their methods of segregation, storage, and rudimentary dismantling pose risks to workers' health and harm the environment.

Lack of transparency

Neither the DoE nor the BTRC has taken steps to publish the list of registered companies for e-waste management. As a result, the general public and bulk e-waste generators are unaware of where to deposit e-waste for environmentally sound handling. Information on the amount of e-waste that is managed annually is also not published. There is no responsible officer in the DoE to monitor whether the environmentally sound management of e-waste is being followed and to disseminate information on this. The DoE also does not publish information on the type of punishment and amount of fine imposed for violating e-waste regulations. On the other hand, companies involved in the manufacturing, assembly, import, and marketing of electronic equipment also do not publish information on their production volume, the amount collected back from consumers after product end-of-life, and the amount of e-waste recycled.

Corruption risks and irregularities

A few formal e-waste recyclers have reported cases of illegal financial transactions to obtain registration and environmental clearances. On the other hand, informal e-waste businesses have also reported cases of illicit financial transactions to obtain licenses or to continue their business. Since the PIC approval process can be time-consuming and costly, actors with an incentive to bypass the Basel Convention rules exploit monitoring gaps by falsely declaring the volume of waste being shipped or indicating incorrect destination countries. The country's largest e-waste exporter took advantage of this monitoring gap, exporting higher volumes than approved in the last three years. Using import & export data obtained from the customs department for HS chapter 8549 (dedicated to e-waste), it was found that since the enactment of e-waste management regulations, $700,000 worth of e-waste materials have been imported in the last 3 years (2022-2024). The amount of e-waste imported illegally over the past three years was 14,985 tons, which is more than the amount of e-waste components exported (4,040 tons of PCBs and scrap). This makes Bangladesh a net importer of e-waste. However, this is likely an underestimation, as there may be cases of misdeclaration in which waste is imported under other HS codes.

Lack of participation in decision-making

Although informal e-waste businesses existed before the regulations took effect in 2021, they are not reflected in the rules, which do not provide a pathway for integration. Despite a decade of deliberations on drafting e-waste management rules, the participation of the informal sector was minimal. The major barriers to informal sectors' participation in decision-making include prejudiced attitudes toward e-waste workers, the lack of informal actors' voices in policymaking, and limited funding to support integration. The survey of informal *Bhangari* shops and interviews with formal recyclers also showed variation in women's participation based on firm size and type. Societal prejudices discouraged informal e-waste businesses from hiring women, while formal e-waste recyclers employed women mainly for segregation work.

Climate change and e-waste in Bangladesh

Open incineration of mixed waste is common in Bangladesh due to inadequate disposal infrastructure. As e-waste is part of mixed waste in Bangladesh, the release of harmful gases and toxic compounds occurs when waste is burned indiscriminately. Furthermore, refrigerators and air conditioning units that have reached the end of their lifespan may contain refrigerants and insulating foams that release hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs), which are potent greenhouse gases. Since refrigerators and air conditioners have a resale market through informal repair shops in Bangladesh, the proper disposal of refrigerants and insulating foams cannot be guaranteed. Bangladesh faces a looming challenge posed by solar photovoltaic (PV) waste, projected to reach approximately 5.496 million tons between 2025 and 2060. Despite this considerable volume, the Hazardous Waste (e-waste) Management Rules (2021) do not classify solar panels as electronic waste, leaving them outside of formal waste regulation and recovery mechanisms. Similar exclusions have occurred for electric vehicle components, which are expected to increase due to climate mitigation policies. Climate-induced natural disasters, such as floods, can also generate significant amounts of e-waste. Using the HAZUS model developed by the Federal Emergency Management Agency (FEMA), it was estimated that the 2022 floods in northeast Bangladesh generated approximately 24,013 tons of e-waste. However, Bangladesh lacks a disaster waste protocol to measure and manage e-waste generated during such events.

Recommendations

Based on these findings, the report outlines twelve recommendations for DoE and other governmental agencies charged with regulating e-waste.

1. The Hazardous Waste (E-Waste) Management Rules, 2021 need to be amended by -
    *   Expanding the scope of e-waste classification in Schedule 1 of the E-Waste Management Rules by adding electric vehicles, solar panels, etc.
    *   Adding specific provisions on incentives and penalties for implementing the rules;
    *   Provisions for the formation of a National Coordination Committee;
    *   Adding specific rules on conditions and penalties for the export of e-waste.

2. A technical guideline for e-waste management should be developed, which will include:
    *   the environmental management and occupational health and safety measures that must be present at the recycling precincts;
    *   conditions informal recyclers have to comply with to obtain registration and clearance;
    *   specific instructions on how to phase out hazardous substances in electronics;
    *   a disaster waste management protocol to manage e-waste generated during disasters.

3. A separate Extended Producer Responsibility (EPR) guideline should be developed for private sector entities involved in manufacturing, assembling, importing, and marketing electronic equipment. The guideline should include -

- A phased implementation plan detailing which electrical and electronic equipment should fall under the EPR scheme in the first, second, and third phases.
- Approaches to e-waste collection and funding mechanisms for Producer Responsibility Organizations (PRO).

4. The Bangladesh Bureau of Statistics (BBS) should prepare an e-waste inventory following *E-waste Statistics: Guidelines on Classifications, Reporting, and Indicators*, created by the United Nations University.

5. A roadmap should be developed with funding to integrate informal businesses (collectors) into the e-waste management system.

6. A separate trade license category should be established for e-waste businesses to make them easily identifiable and ensure the relevant authorities oversee them.

7. The customs department must be strengthened to increase its ability to control the import and export of e-waste and the import of old electronic products.

8. An e-waste disposal policy should be developed with input from relevant stakeholders, applicable to both government and non-government offices. The policy should outline best practices for inventory management of electrical equipment, storage standards, and auction procedures that prevent bidding by businesses not registered under the Hazardous Waste (e-waste) Management Rules.

9. The draft *Electric Vehicle Industry Development Policy (2025)* should incorporate comprehensive guidelines on managing e-waste produced by electric vehicles. EPR guidelines should also be established for electric vehicle manufacturers and importers.

10. DoE and other local government authorities (city corporations, municipalities, and union parishads) should take immediate steps to raise public awareness about e-waste management.

11. The DoE's capacity should be increased to enforce e-waste management rules, and an automated system should be implemented for registering e-waste businesses and submitting their annual reports.

12. A coordination mechanism must be established among all stakeholders involved in e-waste management, including the DoE, BTRC, local government institutions, and others.