

# WASTE MANAGEMENT LAWS IN BANGLADESH: CHALLENGES AND OPPORTUNITIES

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## ABSTRACT

Bangladesh is experiencing a paradigm shift in waste generation patterns due to unprecedented urbanization and industrial growth. This research provides a comprehensive legal and empirical analysis of the waste management crisis in Bangladesh. By scrutinizing the Solid Waste Management Rules 2021 and the Medical Waste Management and Processing Rules 2008, the study evaluates the regulatory landscape. The findings indicate that while the legislative framework is robust on paper, the transition from "collection-disposal" to a "circular economy" model is hindered by institutional fragmentation. This poster presents a roadmap for legal reform, highlighting the necessity of Extended Producer Responsibility (EPR) and public-private synergy to achieve the 2030 Sustainable Development Goals.

## 1. INTRODUCTION

With an annual urban waste generation growth rate of approximately 5%, Bangladesh faces an existential threat from unmanaged refuse. Historically, waste management was seen as a basic municipal cleaning service. However, contemporary research categorizes it as a complex sociolegal challenge. The lack of source segregation leads to toxic leaching into groundwater and the release of greenhouse gases from open landfills. This study contextualizes these issues within the framework of the Bangladesh Environment Conservation Act (BECA) 1995, seeking to bridge the gap between statutory mandates and field-level execution.

## 2. PROBLEM STATEMENT

The primary crisis is not the absence of law, but the "implementation deficit." Municipalities often lack the technical capacity and financial autonomy to enforce the Medical Waste Management Rules 2021. Medical waste, being highly infectious, is frequently mixed with general household waste due to negligence at the primary source. This results in hazardous exposures for informal waste pickers and the general public, as visualized in the dumping sites near critical infrastructure.



Figure 1: Visual Evidence of Open Dumping and Local Pollution.

## 3. RESEARCH OBJECTIVES

- To evaluate the statutory efficacy of the Solid Waste Management Rules 2021 in promoting the 3R (Reduce, Reuse, Recycle) principle.
- To identify the legal barriers in the Medical Waste Management and Proceedings Rules 2008 that lead to unsafe clinical disposal.
- To analyze waste composition data to prove the viability of a circular economy.
- To propose a tripartite governance model involving the Government, Private Sector, and Citizens.

## 4. METHODOLOGY

A multi-dimensional methodology was employed, combining Doctrinal Research (statutory analysis) with Quantitative Data Interpretation. Secondary data from the Dhaka City Corporation (DCC), PRISM Bangladesh, and clinical waste management reports were analyzed. The study additionally applied medical waste compliance analysis by examining segregation practices, licensing requirements, and disposal protocols under the Medical Waste Management Rules 2008. Visual ethnography was also used to document illegal dumping and unsafe clinical waste disposal practices to assess environmental and public health impacts. Comparative analysis evaluated the 2021 Rules against global best practices in Southeast Asia.

## 5. ANALYSIS OF 2021 RULES

The Solid Waste Management Rules 2021 introduced several groundbreaking concepts:

- A. Source Segregation:** Obligates citizens to separate biodegradable from non-biodegradable waste.
- B. EPR (Extended Producer Responsibility):** Makes plastic and electronic manufacturers responsible for the lifecycle of their products.
- C. Local Governance:** Empowers Pourashavas and City Corporations to impose penalties for littering. However, the lack of a "Polluter Pays" enforcement mechanism remains a significant loophole.

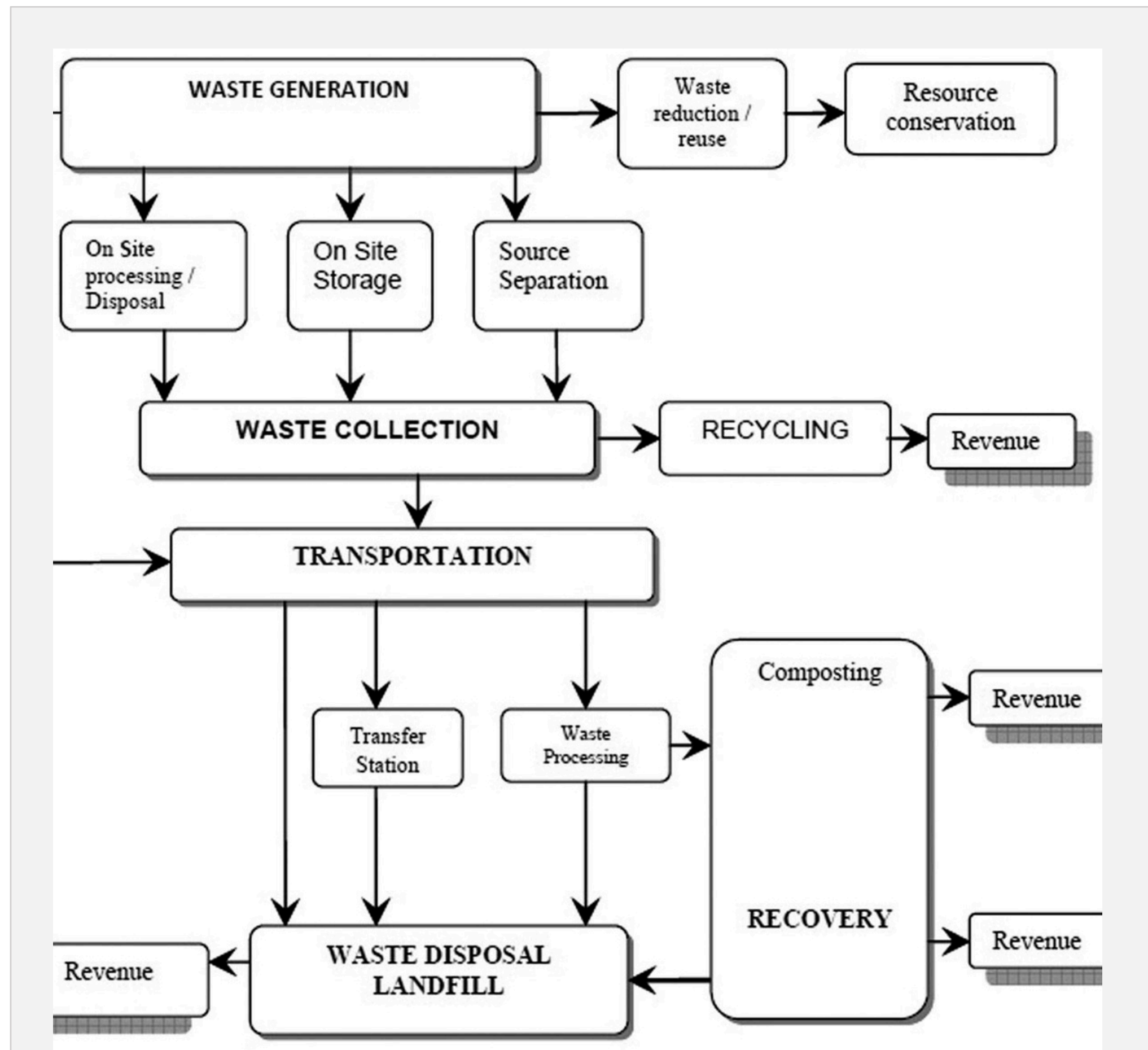


Figure 2: Integrated Solid Waste Management Flowchart (Collection to Recovery).

## 6. DATA FINDINGS & RESULTS

Our analysis of the physical composition of municipal solid waste (MSW) reveals that organic matter dominates the waste stream.

- Food & Vegetable Waste: 68%
- Paper & Plastic: 15% combined.

This high organic percentage suggests that Bangladesh is sitting on a "Gold Mine" of compostable energy. Instead of landfilling, this 68% should be diverted to bio-gas plants or organic fertilizer units.

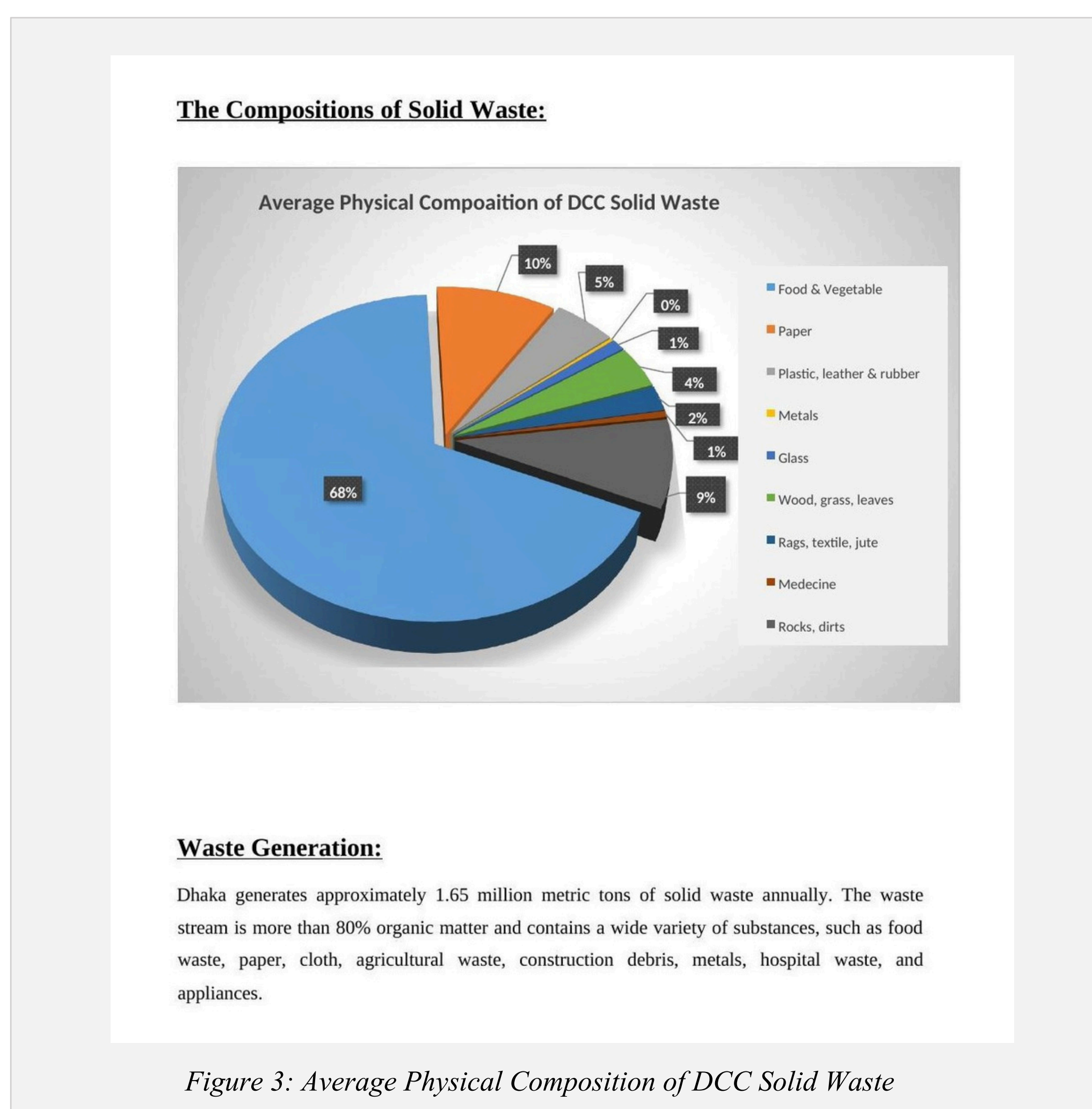


Figure 3: Average Physical Composition of DCC Solid Waste focus on plastic-ban enforcement should be city-centric.

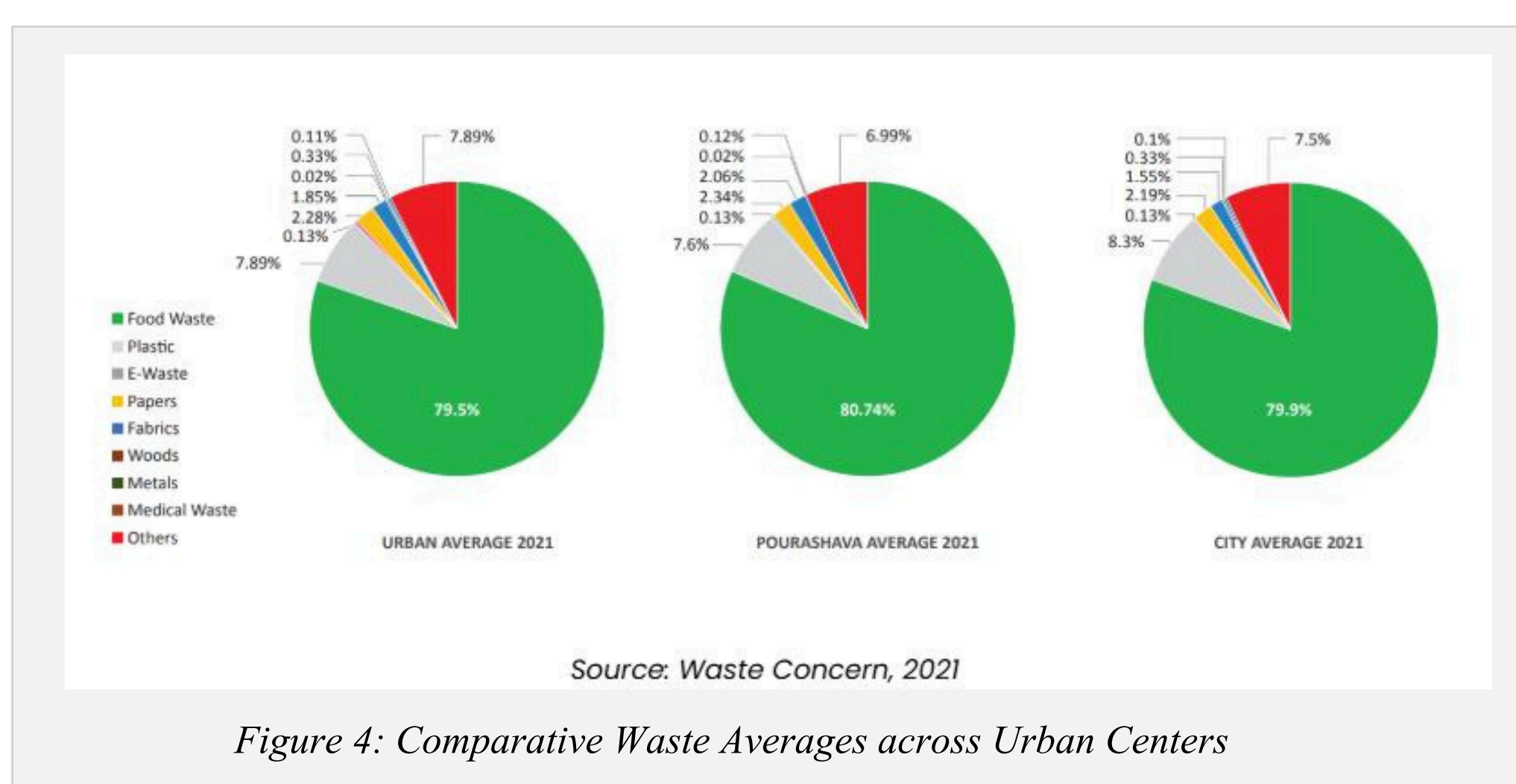


Figure 4: Comparative Waste Averages across Urban Centers

## 7. MEDICAL WASTE HAZARDS

The 2008 Rules mandate strict color-coded segregation (Yellow, Red, Green). Yet, field evidence shows syringes and clinical refuse dumped in the open nature. This poses a massive biological risk, potentially leading to outbreaks of Hepatitis or HIV. The flowchart below outlines the required protocol, which is currently bypassed due to the high cost of autoclaving and incineration for smaller clinics.

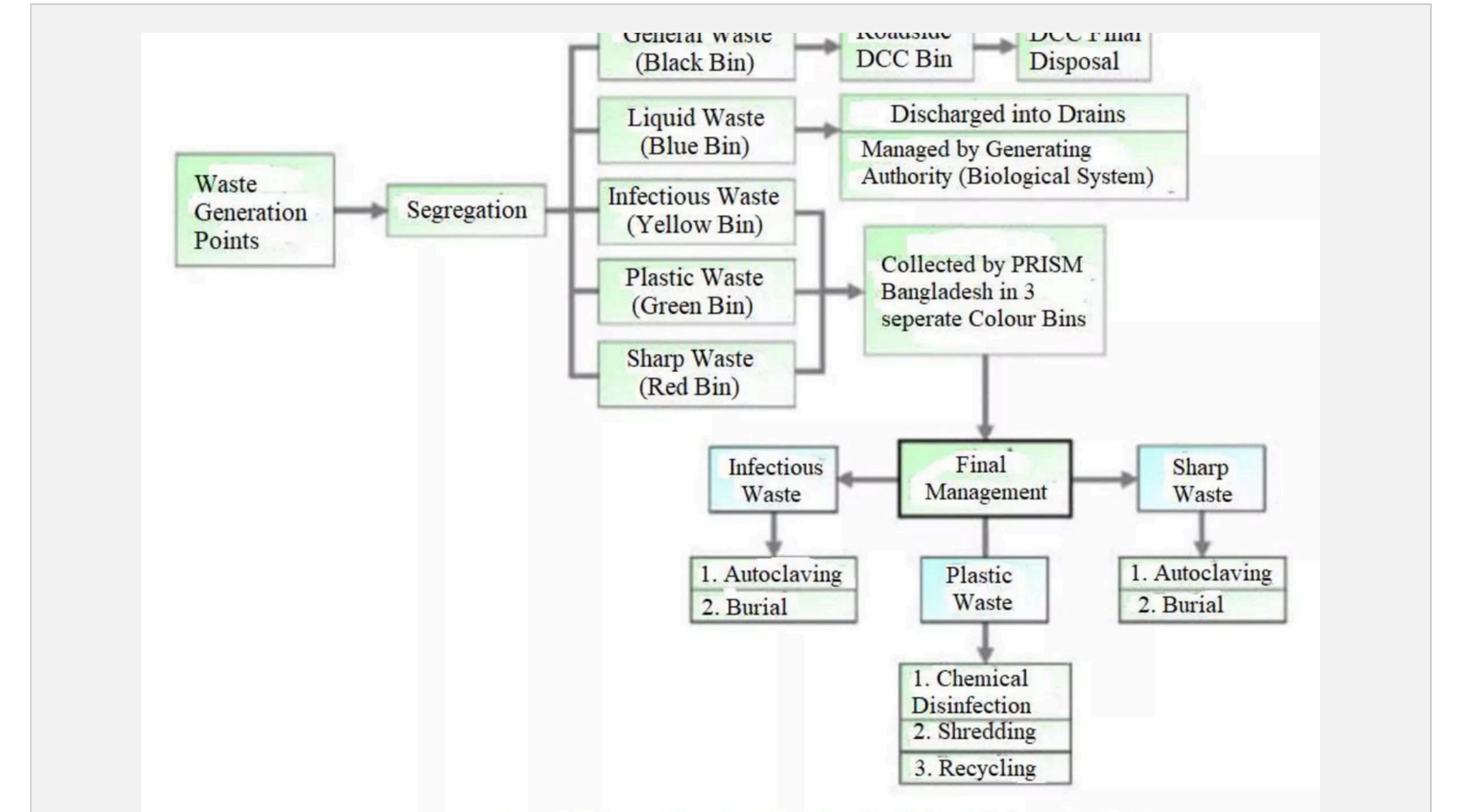


Figure 5: Standard Hospital Waste Management Protocol.



Figure 6: Environmental Impact of Medical Negligence.

## 8. CHALLENGES & BARRIERS

- EPR Implementation Gap:** While the Solid Waste Management Rules 2021 mandate Extended Producer Responsibility (EPR), there is zero visible enforcement, leaving packaging waste entirely to overstretched municipal systems.
- Lack of Accountability:** The 2021 Rules assign waste duties to local government authorities but fail to provide independent monitoring or penalties for institutional non-performance.
- Regulatory Double Standards:** The Medical Waste Rules 2008 create a loophole by requiring strict licenses for private firms while allowing local authorities to handle hazardous waste without equivalent certification.
- Institutional Overlap:** Conflict of jurisdiction between the Ministry of Local Government and the Ministry of Environment (DoE).
- Informal Sector Exclusion:** The "Tokais" or waste-pickers process 40% of recyclables but remain legally unrecognized and socially vulnerable.

## 9. RECOMMENDATIONS

- Institutional Accountability:** Establish a central oversight body to perform mandatory audits on local authorities, ensuring the enforcement of the Solid Waste Management Rules 2021.
- Active EPR Enforcement:** Operationalize Extended Producer Responsibility (EPR) by linking corporate licensing to mandatory waste-recovery plans, shifting toward a circular economy.
- Legal Harmonization:** Standardize the Medical Waste Rules 2008 to require uniform licensing for both private and public sectors, eliminating hazardous waste loopholes.
- Implementing a Digital Waste Tracking System** using IoT for medical waste vehicles.
- Providing Tax Incentives** for industries that utilize recycled plastic in their supply chain (EPR).
- Promoting "Waste-to-Wealth" startups** through low-interest green loans.

## 10. CONCLUSION

Waste is not a liability; it is a resource out of place. The future of Bangladesh's environment depends on how strictly we enforce the 2021 Rules. By transitioning from a linear "Take-Make-Dispose" economy to a circular "3R" model, Bangladesh can simultaneously solve its energy crisis and its pollution problem. Success requires political will, judicial activism, and a shift in public consciousness. Through these reforms, we can ensure a cleaner, greener Bangladesh for future generations.

### Selected References:

- Bangladesh Environment Conservation Act, 1995. | 2. Solid Waste Management Rules, 2021. | 3. Medical Waste Management Rules, 2008. | 4. Dihan et al. (2023), Science of The Total Environment. | 5. Islam et al. (2025), Cleaner Waste Systems.