

BIO-MEDICAL WASTE MANAGEMENT IN RURAL HEALTH INSTITUTIONS: LEGAL AND POLICY DEFICIENCIES IN INDIA

ANIRBAN KUMAR BANERJEE¹ AND PRODIPTA BARMAN^{2*}

Rural primary health services are inextricably linked to healthcare facilities' biomedical waste (BMW) management, but they all have serious issues. Although the Bio-Biomedical Waste Management Rules, 2016, seem strong, rural healthcare facilities have low compliance rates. Lack of infrastructure, monitoring systems, treatment centre access, and inter-departmental coordination are the main causes of this inadequacy. In this paper, I examine legal and legislative barriers to rural biological waste management, focusing on regulatory implementation, institutional alignment, and capacity. I believe that the severe implementation gap, not the legislative framework, is the main barrier, based on CPCB reports, NGT decisions, and the latest empirical data. Thus, to close this gap, I propose a set of recommendations to improve district governance, finances, and monitoring.

Introduction

Uncontrolled and dispersed biomedical waste is very dangerous to the environment and human beings. According to the Central Pollution Control Board (CPCB), India produces about 775 tonnes of biomedical waste materials on a daily basis, with an estimation that 10–15% of the biomedical waste is untreated and/or even disposed of unlawfully¹. The obstacles to policy implementation in rural healthcare facilities, such as primary health centres (PHCs), community health centres (CHCs), sub-centres, and small privately-run clinics with less than five employees, are infrastructural and financial barriers to policy implementation².

To support the segregation, storage, transportation, and treatment process of biomedical waste, the Common Bio-Medical Waste Treatment Facilities (CBWTFs) under the Environment (Protection) Act, 1986, through a colour-

coded system and sanitary disposal to reduce the waste sources were introduced in the Bio-Medical Waste Management Rules, 2016 (hereafter BMW Rules 2016). Nevertheless, some facts indicate that the rural sector is still under-controlled and under-equipped³. The rationale behind this paper is to explore the legal and policy gaps of this rural healthcare institutional system in India.

Legal Framework: Normative Structure

In addition to vaccination drives, blood collection, and domestic health care services, the BMW 2016 Rules include the 1998 Rules' revised Management of Biomedical Waste. The Rules require Biomedical Waste (BMW) segregation, barcoding, transport, and disposal by a “occupier”—a person with administrative power over a health care facility⁴.

State Pollution Control Board consent is required for all occupiers under Rule 8. Rule 11 also mandates annual waste disposal and generation reports. While SPCBs supervise regional policy implementation, the CPCB manages, supervises, and supports technical matters. The CPCB issued additional COVID-19 Biomedical Waste

¹ PhD scholar, Department of Law, Brainware University, Kolkata, India

² Assistant Professor, Department of Law, Brainware University, Kolkata, India

Corresponding Author: dpdb.law@brainwareuniversity.ac.in

management and disposal instructions¹. Instructions were revised in 2018, 2020, and 2023⁵.

Ground-Level Realities in Rural Health Institutions

Rural hospitals lag behind despite legal requirements. The Indian Institute of Public Health found that 38% of rural Primary Health Centres have Community-Based Waste Treatment Facilities in a cross-state survey. Bihar, Odisha, and West Bengal facilities were open burning or deep burial, violating Rule 7(1)⁶.

Over 12,000 non-bedded healthcare facilities are unlicensed, according to CPCB inspections¹. The NGT has ordered states to update healthcare facility inventories in rural areas due to data shortages. Non-compliance is rising due to insufficient staff, inconsistent CBWTF collections, and a lack of oversight⁷.

Significant Legal and Policy Deficiencies

Cover and Approval Deficiencies: Even though the BMW Rules 2016 state that approval is required for all healthcare institutions, several rural units continue to function without any approval. Most State Pollution Control Boards, to this day, continue to have outdated registers of non-bedded and transportable facilities, resulting in the presence of “ghost generators” whose waste remains unaccounted for¹. The gap in the legal obligation and in the execution directly reduces the liability to the environment.

Differences in Treatment Facilities Access: CBWTFs are primarily in urban or peri-urban areas, while many rural regions are out of viable collection ranges. India had, as of 2023, only 230 operational CBWTFs, and they are very unevenly distributed across more than 700 districts. In rural or hilly areas, waste is often illegally dumped in public landfills or incinerated, which has led to numerous NGT⁷ directives due to the resulting contraventions.

Coordination and Lack of Role Clarity: The governance of the BMW involves the health departments, State Pollution Control Boards, panchayats, and waste management operators. However, as per the Rules, the obligations are assigned primarily to “occupiers” and operators of the CBWTF, thus creating a gap in the authority concerning the management of facilities in rural areas that are, to all intents and purposes, under local control⁸. Absence of institutional clarity leads to fragmentation of responsibility for non-compliance. Deficiencies in Capacity and Training:

There are evident gaps in knowledge and practice discrepancies within the rural primary healthcare centres staff in the healthcare field. Numerous staff members are unfamiliar with the colour discrimination, segregation and emergency procedures. The infrequency in training and certification leaves gaps in safety and compliance.

Oversight and Data Transparency: There are indeed prolific gaps in submission. Rule 11 states that the submission of reports to State Pollution Control Boards is to be submitted annually. In many states, submission is nearing 50%¹. Manual submission and the absence of electronic frameworks impede the systems. The Comptroller and Auditor General (CAG) of several states has been criticised for failing to introduce electronic tracking systems and for not conducting inspections as demanded in Rule 13¹⁰.

Financial and Other Constraints: There is a lack of financial support for consumables (such as bags, bins, and barcodes) and transport to CBWTFs within the rural settings. The Rules provide no separate financial provision for BMW compliance in the National Health Mission; thus, these facilities depend on informal district funds¹¹. The absence of funds continues to support these facilities to unsafe waste disposal.

Oversight of Camps and Veterinary Waste: Although the 2016 Regulations have developed to include more immunisation and blood donation centres, the procedures still fall short of what is needed. Compounding the issue of veterinary and animal husbandry waste in the countryside is the division of responsibilities between the local Animal Health Authorities and State Pollution Control Boards (SBCPs). The fragmentation of responsibility and the absence of coordination continue to pose risks to the health of the public.

Judicial Oversight and NGT Interventions

The gesture of the NGT of fortifying the compliance of the Bharat National Waste (BMW) regulations is unheard of. In *Shailesh Singh v. The NGT* determined that all the states should register all non-licensed healthcare facilities and give them district-specific lists of the facilities (*Sheela Hospital & Trauma Centre* (OA No. 710/2017)¹³). In *Re: Compliance of BMW Rules* (OA No. 72/2021)¹⁴, the Tribunal noted that the state governments were at fault because of the delays in approvals, as well as fined them for non-compliance. Not much can be said that the greatest challenge in the scenario is not regulation but compliance.

Recommendations

Inventory of all hospital types on a district level: State Pollution Control boards should keep digital representations of geo-fencing registries of all healthcare facilities, including both mobile and non-bedded units. The requirement of registry revisions in the renewal of any authorisation will increase accountability.

Infrastructure Development and Static and Mobile CBWTF Units: States must encourage a level of private sector involvement on mutually conducive terms to create satellite CBWTFs and/or to roll out mobile treatment vans to rural locations through viability gap funding.

Specific Budgetary Provisions: Biomedical waste management ought to enjoy special allocation offerings of the Health and Family Welfare Ministry under the National Health Mission to cater for the money required in the areas of segregation materials, barcoding, and transportation.

Training and Certification: Healthcare workers in rural areas should be required to take short-term certification courses that should be associated with the facility accreditation and license renewal on an annual basis.

Improved Supervision: Installing full digital waste monitoring facilities in all Primary Health Centres (PHCs) as well as Community Health Centres (CHCs). Live dashboards are to be applied in SPCB and CPCB, and the availability of audits should be opened to the public¹².

Enhanced Coordination: Introduction of District Biomedical Waste Management Committees (not constituted by politicians), consisting of Health, Pollution Control and Local Government, has to be introduced to facilitate smooth sailing.

Temporary Generators Control: The CPCB ought to develop standard operating procedures in immunisation camps and veterinary clinics to deal with the existing gaps in the regulations.

Conclusion

The Indian regulatory system on the disposal of biological waste is all-encompassing; however, rural

institutions of health are not integrated well into the implementation of the regulatory system. The Bio-Medical Waste Management Rules, 2016 outline clear responsibilities; however, lack of infrastructure, transparency of data and interdepartmental coordination leads to dangerous disposal of medical waste. The solution to these disparities requires a complex approach, i.e. legal, administrative, and financial approach that is based at the district level. With the inclusion of digital surveillance, coverage of CBWTF and institutionalisation of training, India can work towards equitable and sustainable biomedical waste management, which will protect the health and environment of the populace. □

References

1. Central Pollution Control Board, *Annual Report on Biomedical Waste Management 2022–23* (CPCB, New Delhi, 2023).
2. A. Ghosh and V. Singh, *Indian J. Environ. Law*, **26**, 42 (2022).
3. R. Das and S. Banerjee, *J. Environ. Health Policy*, **17**, 145 (2023).
4. Ministry of Environment, Forest and Climate Change, *Bio-Medical Waste Management Rules, 2016* (Govt. of India Gazette Notification, New Delhi, 2016).
5. Indian Institute of Public Health, *Survey on Biomedical Waste Practices in Rural India* (IIPH, Hyderabad, 2022).
6. Comptroller and Auditor General of India, *Performance Audit on Waste Management in Healthcare Institutions* (CAG, New Delhi, 2021).
7. National Green Tribunal, *OA No. 710/2017, Shailesh Singh v. Sheela Hospital & Trauma Centre* (NGT, New Delhi, 2022).
8. S. Gupta, *Environ. Law Rev.*, **23**, 189 (2021).
9. R. Kumar, A. Meena, and S. Patel, *J. Health Manage.*, **23**, 563 (2021).
10. Central Pollution Control Board, *Guidelines for Implementation of Biomedical Waste Rules* (CPCB, New Delhi, 2020).
11. P. Pandey, *Public Policy and Governance*, **12**, 201 (2022).
12. R. Sharma, *Indian J. Environ. Stud.*, **14**, 87 (2021).
13. National Green Tribunal, *OA No. 710/2017, Shailesh Singh v. Sheela Hospital & Trauma Centre* (Order dated 20 July 2020).
14. National Green Tribunal, *OA No. 72/2021, In Re: Compliance of BMW Rules* (Order dated 14 March 2021).