Chapter 12
Considerations of Policy and Morality in Waste Management

Manasi Chattaraj
https://orcid.org/0000-0002-1672-0630
Bankura University, India

Aditi Goswami
https://orcid.org/0009-0005-2223-6561
Bankura University, India

Arindam Ganguly
Bankura Sammilani College, India

Sourav Chattaraj
Siksha 'O' Anusandhan University (Deemed), India

ABSTRACT

Today's world is facing serious challenge for waste management. Population explosion, migration, industrialization and modernization has created imbalance to the resource to waste ratio. So, the situation demands paradigm shift towards policy based solutions strongly complying with the Sustainable Development Goals. The traditional top down policies are getting plagued by biasness, inefficiencies and perturbations. So, policies must be looked from the point of morality, environmental ethics and social justice. Updating policies should aim to cut down load of waste and conserve natural resources to ascertain regional development. The emergence of geoinformatics and biotechnology has the potential to bring radical change in waste management, promoting efficiency, sustainability and informed decision-making. In this chapter attempts will be made to analyse the existing waste management policies and the lacunas, explore the moral dimensions of waste management, suggest advanced waste management approaches and prepare a geospatial technology based umbrella policy for waste management.

DOI: 10.4018/979-8-3693-7282-1.ch012

1. INTRODUCTION

The contemporary world is facing serious challenges in waste management. Waste management is a strong indicator of urban planning and management, is a critical component for attaining environmental sustainability, and has a significant impact on public health (Shaw, 1992; Das et al., 2019; Fatimah et al., 2020; Roy et al., 2023). Currently, waste management is not merely a logistical challenge but a profound moral and policy issue that cross-cuts environmental sustainability, public health, and social justice (Zelinka, 2019; Pope, 2020; Wittmer, 2023). As population multiplication and consumption patterns evolve, the volume of waste generated increases simultaneously, exacerbating the pressure on existing waste management systems and the environment (Misha & Pandey, 2005; Olufayo & Omotosho, 2007; Khajuria et al., 2008; Shekdar, 2009; Medina, 2010; Taylor, 2012; Ashikuzzaman & Howlader, 2020, Supangkat, 2020). Population explosion, migration, and industrial influx coupled with a stream of modernization have created an imbalance in the resource to waste ratio worldwide (Renner, 1997; Eyo & Ogo, 2013; Smil, 2021; Sukanya & Tantiya, 2023). Therefore, the ever-growing burden of waste management necessitates a paradigm shift towards long-term, sustainable, and effective policy-based solutions for the conservation of landscape ecology and strengthening the local economy (Ducker, 1996; Mbau, 2015; Nicolli, 2019; Obani, 2019; Wan et al., 2019). Policies on waste management should comply strongly with the Sustainable Development Goals of creating a liveable future earth by ensuring environmental sustainability, public health, and social justice (Morton et al, 2017; Gebeyhu, 2019; Messerli et al., 2019). The disposal and management of waste pose significant legal and ethical considerations that require action (Ducker, 1996; Llamas, 2003; Godbole, 2011; Govindrajan, 2021). The Ministry of Environment, Forest, and Climate Change (MoEF and CC),Government of India, under the Environment Protection Act of 1986, has taken several initiatives and rolled out many policies and guidelines aimed at identifying, examining, validating, and formulating technologies to treat waste to generate energy, recycle materials, extract resources, and provide a technical database of national and international technologies to support local bodies addressing their waste-related challenges. In addition, the Central Pollution Control Board (CPCB) has launched a series of laws and regulations to ensure environmentally sound practices for waste management and associated pollution control. However, the traditional and existing policies of waste management are partially working, and sometimes plagued by bias, inefficiencies, dearth of comprehensive real-time and reliable monitoring, lack of public awareness, and socio-political perturbations. Most of the policies are top-down and create diverse disparities between the educated urban cohort and the poor semi-educated or uneducated rural counterparts, taking toll on environmental well-being and public health. Therefore, there is a need to look deeper into policies from the perspectives of morality, environmental ethics, and social justice. Implementing and updating waste management policies should not only aim to reduce the load of waste on landfills and treatment plants but also aim to conserve natural resources by reintroducing recycled materials back into the production cycle, thereby minimizing the environmental impact of extracting pristine resources and ascertaining regional development by creating local employment opportunities. Moreover, prioritizing sustainability through advanced waste management policies attracts foreign entrepreneurs and investors, who are interested in green technologies, driving further economic growth and innovation. The emergence of geospatial technologies such as Remote Sensing (RS) and Geographic Information System (GIS) integrated with the Internet of Things (IOT) and machine learning has the potential to bring about radical changes in waste management policies and practices, promoting efficiency, sustainability, and informed decision-making in a cost-effective manner. Apart from geoinformatics-based approaches, biochemical