
SOLID WASTE MANAGEMENT- A COMPARITIVE STUDY OF INDIA AND JAPAN

Author: N R Brijesh, III Year Of BBA.,LL.B From Christ University

ABSTRACT

Environment sustainability is the talk of the world. There are several ways to protect the environment for the future generation. The unstainable management of solid waste in various countries, including India, stems from factors like population growth, increased waste volume and inadequate infrastructure. Traditional beliefs and inefficient practices exacerbate the problem. Sustainable waste management necessitates eco-friendly, affordable and socially acceptable approaches. The two most populous counties, India and Japan is taken for study to understand the role of different stakeholders in solid waste management the economic and environmental impacts and the challenges of managing hazardous waste. The laws governing the solid waste management in both the countries and initiatives taken by these countries. This research mainly focuses to compare the legal frameworks and implementation mechanisms for solid waste management in the two countries, with a view to drawing lessons from the Japanese experience that can be applied to improve solid waste management in India. This research also aims to identify the similarities and differences between Solid waste management laws of the two countries and to analyse their effectiveness. The study aims to contribute to a better understanding of the legal and institutional frameworks for solid waste management in India and Japan, and to identify ways to improve solid waste management in India by learning from the Japanese experience.

Key words: Environmental sustainability, laws governing, legal framework, solid waste, solid waste management

INTRODUCTION

Solid waste refers to the useless or unwanted materials that is been caused due to humans in industrial, residential and commercial areas. Solid waste management can be described as the generation, collection, storage, transport, treatment, and disposal of solid waste. Disposal

of waste was not a concern during the early days because the population was less and the area for dumping the waste was quite large. ¹This has become a matter of concern now with the increase in population and the different kinds of waste being generated. With rapid industrialization taking place in India, the slums are getting extended and has produced an increase in the sanitation and environmental concerns.

Jurists who support environmental justice argue that waste management prioritize the equitable distribution of environmental benefits and burdens. They emphasize that there is a need for fair decision making processes and equal access to clean and healthy environment due to disproportionate impact of waste disposal on marginalized communities. The Utilitarian thinkers focus on maximizing overall welfare and utility and from their perspective waste management should aim to minimize harm to human and non-human beings and to promote greatest happiness to greatest number. Their ethics support waste reduction, recycling and sustainable waste management practices that minimize negative consequences.²

The polluter pays principle states that the cost of pollution will be borne by those who pollute it. This particular principle plays an important role in waste management by holding waste generators responsible for managing and disposing waste in such a manner that minimizes the harm to the environment and public health. Whereas, the precautionary principle places a duty on the authorities to take preventive measures in the face of potential harm to the environment or public health and emphasizes the need for scientific evidence and risk assessment in decision-making process related to waste management.

India generates over 62 million tonnes of municipal solid waste per year, making it one of the largest waste generators in the world. However, India's waste management infrastructure is struggling to keep up with the growing volume of waste. As a result, a significant portion of India's waste is not collected or disposed of properly, leading to environmental pollution and public health risks. The Municipal Solid Wastes (Management and Handling) Rules, 2000 were enacted to provide a framework for improved waste management in India. These rules emphasize waste segregation at source, collection of segregated waste by door-to-door

¹Robinson, W.D. (1986), *the Solid Waste Handbook: A Practical Guide*, John Wiley & Sons, Chichester.

²McKay, R. B. (2000). *Consequential Utilitarianism: Addressing Ethical Deficiencies in the Municipal Landfill Siting Process*. *Journal of Business Ethics*, 26(4), 289–306. <http://www.jstor.org/stable/25074348>

services, and disposal of waste in sanitary landfills. However, the implementation of these rules has been challenging, due to various factors such as lack of public awareness, inadequate infrastructure, and financial constraints. The Swachh Bharat Abhiyan (Clean India Campaign) was launched in 2014 to promote cleanliness and improve waste management practices in India. The campaign has made some progress in terms of increasing public awareness and improving access to sanitation facilities. However, significant challenges remain in terms of improving waste collection and disposal practices. In contrast, Japan is a world leader in solid waste management. The country has a comprehensive waste management system that emphasizes waste reduction, recycling, and incineration. Japan's waste management laws are stringent and well-enforced, leading to a high level of compliance from the public and private sectors. The Waste Management and Public Cleansing Act is the primary law governing solid waste management in Japan. This law requires households and businesses to segregate their waste into different categories, such as recyclables, food waste, and combustible waste. Segregated waste is then collected by municipal authorities and disposed of in accordance with the law. Japan has a high recycling rate, with over 80% of municipal solid waste being recycled. Recyclable materials are collected from households and businesses and processed into new products. Food waste is composted or used to generate biogas. Combustible waste is incinerated in modern incinerators that are designed to minimize emissions. Japan also has a well-developed waste-to-energy program. Waste-to-energy plants incinerate combustible waste to generate electricity. This helps to reduce Japan's reliance on fossil fuels and also helps to reduce the volume of waste that needs to be disposed of in landfills.

This research mainly focuses to compare the legal frameworks and implementation mechanisms for solid waste management in the two countries, with a view to drawing lessons from the Japanese experience that can be applied to improve solid waste management in India. This research also aims to identify the similarities and differences between Solid waste management laws of the two countries and to analyse their effectiveness. The study aims to contribute to a better understanding of the legal and institutional frameworks for solid waste management in India and Japan, and to identify ways to improve solid waste management in India by learning from the Japanese experience.

SOLID WASTE MANAGEMENT IN INDIA

India, the second most populous country in the world, has a fast-growing economy and a rapidly urbanizing population. As cities grow, so does waste generation. Historically, Indians have recycled and reused materials whenever possible. However, with the increasing number of towns and cities, waste management has become a major challenge. In 2014, the Indian government launched the Swachh Bharat Mission (Clean India Mission) to improve sanitation and waste management in both urban and rural areas. In 2016, the government also revised and established waste management rules for six types of waste, including Trans boundary movement. These initiatives are helping to shift the paradigm of waste management in India and address the challenges posed by urbanization and population growth. India is facing a growing waste management challenge due to rapid urbanization and population growth. The government has launched initiatives to improve sanitation and waste management, including the Swachh Bharat Mission and revised waste management rules. These initiatives are helping to shift the paradigm of waste management in India.

Waste, Solid waste management was not a problem until nature itself took care of the abandoned materials in the environment. This became an issue when the amount of waste generated was so high, to an extent where the management of waste became impossible without human intervention. With the beginning of industrialization in 1970's the generation of toxic and chemical waste increased. India made an attempt to include waste management into the laws way back in 1970's³. The third five year plan made an attempt to compost the municipal waste in urban settlement post which financial assistance was given to the state for setting up of composting plants in the fourth five year plan. C The provision in the water act which mandated the payment of tax for sanitary landfill, composting and anaerobic digesters. Till the 1980's solid waste management was dealt separately and their relation with air and water was ignored. The Bhopal gas tragedy highlighted the concern of hazardous waste. Then the ministry of Forest and climate change came up with the Environment protection act 1986 which conferred the power to the central government to regulate all forms of waste. Post this under the environment protection act 1986, Hazardous waste (management and handling) rules 1989, Bio-medical waste handling rules 1998 were legislated to address environmental pollution.⁴ In 1995 Bajaj committee was formed as a result of Surat plague which came up with effective rules for solid waste management in urban areas. The Supreme Court at the same time appointed a body to observe the waste management in cities. The report of the

³ G. S. (2020). *Waste Management under the Legal Framework in India*. Ghosh, Sadhan.

⁴ D. D. (2022). *Journey of Waste Management Regulations in India: A historical account*. Dave, Deeksha.

committee stated that solid waste management at one hand has contributed towards climate change. The government then came up with the Municipal Solid Waste management rules 2000 which aimed at developing a scientific technique for safe dumping of solid waste. These rules were not implemented in a proper manner and there was an increase in threat due to the plastic and electronic waste which forced the government to come up new set of rules. The rules were modified and was named as the Solid Waste Management Rules 2016. These rules are applicable to all sectors and places.

The current law in place that deals with solid waste management in India is the Solid Waste Management Rules 2016. The Solid Waste Management Rules, 2016 (SWM Rules, 2016) were notified by the Ministry of Environment, Forest and Climate Change (MoEFCC) on April 8, 2016, to supersede the Municipal Solid Wastes (Management and Handling) Rules, 2000. The Solid Waste Management Rules, 2016 are a comprehensive set of rules that cover all aspects of solid waste management, from generation to disposal. The Solid Waste Management Rules, 2016 are applicable to all urban local bodies (ULBs), census towns, notified areas, notified industrial townships, areas under the control of Indian Railways, airports/airbases, ports and harbours, defence establishments, special economic zones (SEZs), State and Central government organisations, places of pilgrims, and religious and historical importance.

Under this act every waste generator is required to segregate waste into three categories: biodegradable, non-biodegradable, and domestic hazardous waste. Biodegradable waste must be composted or bio-methanated on-site or handed over to a waste collector or agency authorized by the local body. Non-biodegradable waste must be handed over to a waste collector or agency authorized by the local body for recycling or reuse. Domestic hazardous waste, such as batteries, fluorescent tubes, and expired medicines, must be handed over to a waste collector or agency authorized by the local body for safe disposal.⁵The local bodies are responsible for providing waste collection, transportation, processing, and disposal services to all residents and businesses within their jurisdiction. Local bodies must also identify suitable sites for sanitary landfills and develop and implement waste management plans.

The implementation of the Solid Waste Management Rules, 2016 has been a challenge. However, there has been significant progress in recent years. Many ULBs have implemented

⁵ Solid Waste Management Rules 2016.

waste segregation at source and have established waste processing and treatment facilities. The informal sector has also been integrated into the waste management system in many places. Therefore these rules are a comprehensive and progressive set of rules that have the potential to revolutionize waste management in India. The effective implementation of these rules will require sustained efforts from all stakeholders, including the government, local bodies, the informal sector, and the public. ⁶Some of the challenges faced are:

- I. Characterization of solid waste: India being a vast country is culturally diverse in nature and different sect of people follow their own respective traditions and this leads to the production of different kinds of waste considering the food habits, different climatic zones and different living standards. The policy makers depend on limited sources while framing the policies due to which appropriate solutions are not identified yet.
- II. Implementation of Rules: implementation is one of the major challenge that is faced. The Urban local bodies have been found not implementing the rules properly. This has created a need for designated officers and staff members in urban local bodies who are specialized in solid waste management. Adequate prior training should be given to them.
- III. Lack of coordination between state and centre: Less dialogue between the Central and State governments can have a significant impact on the implementation of policies at the ground level. This is because the Central government is responsible for formulating policies, while the State governments are responsible for implementing them. Without effective dialogue and coordination between the two levels of government, it can be difficult to ensure that policies are implemented effectively and efficiently.
- IV. Failure of waste-to-energy projects: The project of waste-to-energy projects are still a dream in India and there is a need to import technologically and economically feasible plants. There is also need for segregated wastes for effective implementation of the waste-to-energy projects.
- V. Involvement of Organized sector: For improving the collection of wastes, segregation rag pickers and be employed through organized sectors. This has been ignored due to lack of recycling industries. In recent times there have been an increase in the

⁶ J. R. (2016). *Status and challenges of municipal solid waste management in India: A review*. Ahmed, Sirajuddin.

recycling industries which is a positive sign for the country as well as to the environment.

SOLID WASTE MANAGEMENT IN JAPAN

Japan's environmental laws affecting solid waste management are based on the Basic Law for Environmental Pollution Control, which was enacted in 1967. This law established the framework for pollution control, including solid waste management. A number of other laws have been enacted to protect the environment, including the Waste Disposal Law (1970), the Recycling Law (1991), and the Air Pollution Control Law (1968). The Waste Disposal Law is the principal law affecting solid waste disposal. It categorizes waste as either Industrial Waste or General Waste. Industrial Wastes are those generated by business and industrial activities, while General Waste includes all wastes not defined as Industrial Waste. The law also creates a subcategory, Specially Managed Wastes, for both Industrial and General Waste. Specially Managed Wastes are those that require special treatment or disposal because they are hazardous, explosive, toxic, infectious, or in other ways possibly detrimental to human health or the environment.⁷ The Waste Disposal Law provides for the financial support of municipalities, including subsidies for the construction of waste-processing and disposal facilities. The national government is also responsible for providing assistance in the financing of these facilities. The Waste Disposal Law also specifies the standards for landfills, including their design, operation, and maintenance. Wastes that are permitted to be disposed of by ocean dumping are defined in the Waste Disposal Law, while the ocean-disposal methods and the areas within the ocean where dumping is permitted are governed by the Prevention of Marine Pollution and Maritime Disaster Law. The Recycling Law outlines the general responsibilities of governments, businesses, and consumers in promoting the use of recycled materials. Japan's national, prefectural, and municipal governments are responsible for helping to secure funding, promoting research and development, and developing public awareness campaigns. Businesses are encouraged to increase their use of secondary materials and to promote post-consumer and manufacturing by-product recycling. Consumers are to cooperate with the actions taken by the government and businesses to promote recycling. The Japanese government has not promulgated any regulations governing the control of dioxins and furans from the combustion of municipal solid waste or the

⁷Shigeto Tsuru and Helmut Weidner (eds.), *Environmental Policy in Japan* (Ed. Sigma Bohn, 1989), p. 47.

disposal of the resultant ash. Rather, after the completion of a five-year study (1985 through 1990) of the mechanism of formation and degradation of dioxins, the Ministry of Health and Welfare issued a set of guidelines for municipal solid waste combustion and ash disposal. The Japanese have not promulgated any regulations for the control of heavy metal emissions. Many local communities attempt to reduce mercury emissions by separating, at the source, materials that contain mercury, such as thermometers, dry cell batteries, and fluorescent light bulbs. Solid waste management in Japan, including collection, recycling, processing, and disposal, is implemented in accordance with the Waste Disposal Law, which the Ministry of Health and Welfare (MHW) is responsible for administering.

Japan's solid waste management system is governed by the Waste Disposal and Public Cleansing Law (the "Waste Disposal Law"), which is administered by the Ministry of Health and Welfare (MHW). The Waste Disposal Law defines waste as any solid or liquid matter that is filthy or unnecessary, excluding radioactive waste and waste polluted by radioactive waste. Waste is categorized as either industrial waste or general waste. Industrial waste is generated by business and industrial activities and is the responsibility of the generator to dispose of. Business and industrial enterprises must endeavor to reuse or reduce the amount of waste that they generate. They must also consider the ease of treatment and disposal of the products and packaging that they manufacture, process, or sell. General waste is all waste that is not industrial waste. It includes residential waste, as well as waste generated by businesses, institutions, and other organizations. Municipalities are responsible for planning, developing, and implementing waste management systems for general waste. This includes collection, transportation, recycling, processing, and disposal. Municipalities have the exclusive right to manage general waste.⁸ They can charge for these services, but the prices cannot exceed those charged by the municipality in accordance with municipal ordinances. Before constructing or significantly modifying a general waste processing or disposal facility, municipalities must notify the governor of the prefecture. These facilities must meet the performance standards and operator qualification requirements established by the Ministry of Health and Welfare.

The Waste Disposal Law also provides a system of waste classification and collection in which the waste is classified into different categories, such as recyclables, combustible

⁸*Plastic Waste Management Institute, Surveys and Public Relations Department, Plastic Waste: Disposal and Recycling, Past, Present and Future in Japan (Tokyo: 1991).*

waste, and non-combustible waste. Municipalities are responsible for developing and implementing waste collection systems that are appropriate for the types of waste that are generated in their communities. A system of waste recycling and composting is there where municipalities are encouraged to promote waste recycling and composting.⁹ They can do this by providing curb side recycling programs, establishing drop-off centres for recyclable materials, and providing composting bins to residents. Municipalities are responsible for developing and implementing waste processing and disposal facilities. These facilities must be designed and operated in a way that protects human health and the environment.

Waste generators must comply with the regulations that apply to the types of waste that they generate. For example, industrial waste generators must obtain a permit from the MHW before disposing of their waste. Waste collection and processing facilities must meet certain performance standards. For example, waste incinerators must be equipped with pollution control devices to reduce emissions of pollutants into the air. Waste disposal facilities must be located in appropriate areas and must be designed and operated in a way that minimizes the impact on the surrounding environment.

Japan's solid waste management system has been effective in reducing the amount of waste that is disposed of in landfills. In recent years, the amount of waste disposed of in landfills has declined significantly, while the amount of waste that is recycled and composted has increased. This has resulted in a number of environmental benefits, such as reduced greenhouse gas emissions and improved water quality. The Japanese government is working to address these challenges. For example, the government has introduced a number of financial incentives to encourage waste recycling and composting. Additionally, the government is working to educate the public about the importance of waste reduction and recycling.

The Japanese government faces a number of challenges in the management of solid waste management. Some of the key challenges include:

1. Rising costs of waste collection and disposal

⁹Ministry of Health and Welfare. *Disposal and Public Cleansing Law, 1992. (English) The Outline of Amendment Bill of Waste*

The cost of waste collection and disposal has been rising in recent years, due to a number of factors, including:

- The increasing volume of waste generated: Japan generates a significant amount of waste per capita, and this volume is expected to continue to increase in the coming years.
- The increasing complexity of waste streams: The types of waste generated are becoming increasingly complex, due to the increasing use of new materials and technologies. This makes waste processing and disposal more challenging and expensive.
- The need to meet stringent environmental regulations: Waste processing and disposal facilities must meet strict environmental regulations in Japan. This can lead to higher costs for operators.

2. Public resistance to waste recycling and composting

While the Japanese public is generally supportive of waste reduction and recycling, there is still some resistance to these practices. This is due to a number of factors, including:

- Lack of awareness: Some people are not aware of the benefits of waste reduction and recycling, or they do not know how to participate in these programs.
- Convenience: Waste reduction and recycling can be inconvenient, especially for people who live in apartments or other small spaces.
- Cost: Some people believe that waste reduction and recycling are too expensive.

3. The need to develop new waste management technologies

The existing waste management technologies are not always able to deal with the new types of waste that are being generated. For example, the increasing use of electronic products has led to a sharp increase in the generation of electronic waste (e-waste). E-waste contains hazardous materials, such as lead and mercury, which require special handling and disposal.

4. The need to secure public acceptance of new waste management facilities

The construction of new waste management facilities, such as incinerators and landfills, often faces public opposition. This is due to concerns about the potential environmental and health impacts of these facilities.

5. The need to coordinate waste management efforts across different levels of government

Waste management is a complex issue that requires coordination between different levels of government, including the national government, prefectural governments, and municipal governments. This coordination can be challenging, especially when there are competing interests and priorities.

The Japanese government is working to address the challenges of solid waste management through a number of initiatives, such as:

- Promoting waste reduction and recycling: The government is working to raise public awareness of the benefits of waste reduction and recycling, and to make it easier for people to participate in these programs.
- Developing new waste management technologies: The government is supporting the development of new waste management technologies that can deal with the new types of waste that are being generated.
- Securing public acceptance of new waste management facilities: The government is working to engage with the public early in the planning process for new waste management facilities, and to address their concerns.
- Coordinating waste management efforts across different levels of government: The government is working to improve coordination between different levels of government on waste management issues.

COMPARATIVE ANALYSIS OF SOLID WASTE MANAGEMENT LAWS IN INDIA AND JAPAN

I. Population:

According to the World meter population estimates, as of November 10, 2023, the population of India is 1.43 billion, while the population of Japan is 123.29 million. This means that India has a population that is about 11.6 times larger than Japan's population.

COUNTRY	POPULATION
INDIA	1.43 Billion
JAPAN	123.29 Million

India has a significantly larger population than Japan. This is due to a number of factors, including India's higher birth rate and lower death rate. Additionally, India has a much younger population than Japan, with a median age of 28.7 years compared to Japan's median age of 49.3 years. The population difference between India and Japan is significant, and it has a number of implications for both countries. For example, India faces a number of challenges in providing basic services to its large population, such as education, healthcare, and sanitation. Japan, on the other hand, faces a number of challenges related to its aging population, such as a shrinking workforce and increasing pension costs. Despite their differences, India and Japan are both important countries in the Asia-Pacific region. They are both members of the G20, and they have strong economic and political ties.¹⁰

II. Definition

Comparing to India Japan has a bit more broad and vast definition as per their respective laws. Solid waste according to japan refers to those waste other than industrial waste, whereas the definition as the solid waste management rules 2016 is specific in nature which includes waste comprising of municipal solid waste, commercial waste, waste from all industries but it does not include hazardous waste.

¹⁰Worldometer population Report 2023.

III. 3 R's (Reduce, Reuse, Recycle)

The recycling practices in Japan are more formal and successful than in India. In Japan, the government has implemented a number of programs to promote the 3Rs (reduce, reuse, recycle) and producer responsibility. These programs have been successful in reducing waste generation and increasing recycling rates. For example, the Yokohama G30 plan reduced MSW by 42 percent compared with 2001. In India, the informal sector is much more prevalent in recycling. Rag pickers, who are often Dalits or untouchables, collect recyclable materials from dumpsites and other sources. The informal sector plays a vital role in recycling in India, but it is also associated with a number of problems, such as child labour and unsafe working conditions. The government of India has not shown much interest in promoting the 3R philosophy or recycling industries. This is due to a number of factors, including improper law enforcement, corruption, high population, and immigration of people from rural to urban areas.

CONCLUSION

The study concludes with certain facts about waste management practices and laws governing waste management in India and Japan. As per the study, India generates over 62 million tonnes of municipal solid waste per year, making it one of the largest waste generators in the world. The Bhopal gas tragedy highlighted the concern of hazardous waste, hence in 1995 Bajaj committee was formed as a result of Surat plague which came up with effective rules for solid waste management in urban areas. The major challenge is with the rules of implementation, lack of coordination between the state and centre and lack of recycling industries. In 2014 clean India Campaign known as The Swatch Bharat Abhiyan was launched promote cleanliness and improve waste management practices in India. In 2016, the government also revised and established waste management rules for six types of waste, including Trans boundary movement. Waste, Solid waste management was not a problem until nature itself took care of the abandoned materials in the environment. This became an issue when the amount of waste generated was so high, to an extent where the management of waste became impossible without human intervention. The current law in place that deals with solid waste management in India is the Solid Waste Management Rules 2016. Under this

act every waste generator is required to segregate waste into three categories: biodegradable, non-biodegradable, and domestic hazardous waste. Japan's solid waste management system is governed by the Waste Disposal and Public Cleansing Law (the "Waste Disposal Law"), which is administered by the Ministry of Health and Welfare (MHW). Japan's solid waste management system has been effective in reducing the amount of waste that is disposed of in landfills. The huge challenge in Japan is the rising cost of waste collection and disposal, the need to meet stringent environmental regulations, public resistance to waste recycling and composting and the need to develop new waste management technologies. Besides the challenges, both the countries have taken several initiatives to manage waste more effectively. The recycling practices in Japan are more formal and successful than in India.



BRILLOPEDIA