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Environment Sustainability and Municipal Solid Waste Management

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Abstract

In India, where "urbanization, industrialization, and economic expansion" have increased the creation of MSW per person, "Solid Waste Management (SWM)" is a serious issue for many "Urban Local Bodies (ULBs)". In densely populated urban areas, effective SWM is very difficult to achieve. Negligible waste "collection, transportation, treatment, and disposal", together with excessive waste output, pose serious environmental problems for India. There are various negative effects on public health and the environment as a result of the inadequacy of India's current waste management systems brought on by the country's rapidly expanding urban population. While there are many obstacles to overcome, the possibilities are also substantial.

This paper explores the evolution of waste management practices, examining historical, cultural, and legal perspectives. It highlights ancient Indian principles of environmental sustainability and compares them with modern laws. Focusing on urban challenges, the study emphasizes the need for sustainable strategies informed by historical insights and cultural attitudes toward cleanliness and waste disposal.

Keywords- urbanization, industrialization, solid waste management, environment, treatment and etc.

1. INTRODUCTION

Since the beginning of human race, people have used nature for their own benefit, which has a significant impact on the environment. Environmental law now encompasses a wider range of topics, including Solid Waste Management, in response to several pressing environmental concerns. While garbage has always been an issue for every civilization, it was far less of a concern for humans prior to the industrial revolution. This began with the expansion of urban areas and the subsequent rise in population.[1]

Rapid industrialization is replacing India's traditional agrarian economy. A growing fraction of the population is settling into city life, with 31.2% of the population doing so as of the 2011 census. So, it's prudent to say that the increasing number of city dwellers is to blame for the MUST overflow. Urban areas produce an estimated 62 million tons of garbage annually, with that number projected to rise to "165 million tons in 2031 and 436 million tons in 2050, according to the

[1] S Rathi, 'Waste Management in India: A Review' (2011) 31 Waste Management 1355.

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Planning Commission Report 2014". Every day, 135,198 tons of trash are produced; however, only 23% of that material is actually handled, according to the "Central Pollution Control Board's annual report". Polluting options for the leftover garbage are land filling or incineration.[2]

1.1 Research Questions

1. How have historical and cultural factors shaped waste management, and how do they compare to modern practices?
2. How do ancient Indian principles of cleanliness align with modern waste management laws?
3. What challenges in urban waste management can be addressed using historical and cultural insights

1.2 Research Methodology

The methodology used in the paper is doctrinal in nature. The researcher has gathered information from both primary and secondary sources like statutes, case laws, commentaries, reports, books, journal articles and websites.

2. EVOLUTION OF WASTE MANAGEMENT PRACTICES

2.1 Historical, Cultural, and Legal Perspectives

In ancient towns, garbage was dumped on unpaved roads and streets and was allowed to pile up. Athens did not pass the first statute outlawing this practice until the year 320 BC. Around that time, in the Greek-ruled cities of the eastern Mediterranean, a system for waste collection began to take form. Keeping the path in front of one's home clean was an ancient Roman civic responsibility. However, the only time we heard of coordinated trash pickup was during parades and other state-sponsored events. Outside the city walls, in open pits, were disposed of in a very rudimentary manner. There were attempts to move garbage further away from cities as populations grew. During the Middle Ages, garbage collection and public cleanliness both declined when Rome fell. The duty of transporting garbage to landfills outside of cities was passed down to scavengers toward the close of the fourteenth century. The situation was different in smaller towns, however, as the majority of residents continued to litter the streets with trash. The appointment of an official scavenger was not mandated for any English city until 1714. Cities like Philadelphia, New York, and Boston started collecting trash as a governmental service at the turn of the 18th century. But the mechanisms for disposing of waste were still somewhat rudimentary. Take

[2] J Gupta, *Solid Waste Management in India: Policies, Strategies, and Technologies* 78-85 (Springer 2014).

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Philadelphia as an example; the city's garbage was just thrown into the Delaware River downstream.[3]

Living in cleanliness and harmony with nature has been the central tenet of Indian society since the Vedic era. Everything from the Vedas and Upanishads to the Spirits and Dharmashastras encourages a reverent attitude toward nature and all its inhabitants, including trees, plants, the sky, water, and vayumandal (the sky). Because of their sacred status as Gods and Goddesses, it was considered sinful to desecrate the earth, water, or air. It was believed that everyone should do their part to keep them clean. It was also deemed criminal and banned to dump waste, dust, debris, bits of meat, etc. on highways and into bodies of water in the Manusmiriti, the earliest comprehensive presentation of Hindu law. It stressed the need of keeping the air surrounding cities and villages clean, sanitary, and free of pollution. It was believed that everyone had an obligation to practice good hygiene and to keep public spaces clean, and that doing otherwise was criminal. Keeping one's environment clean was a top priority, according to Kautilya in his Arthshastra.

Environmental contamination and the potential societal ills it causes were also mentioned in the ancient epic Mahabharata. Water and air pollution create many different kinds of ailments, thus the Charka, a doyen of Ayurveda, also stressed how important it is to have clean water and air. Rivers are seen as holy and respectable by Hindus, and other texts have also warned against dumping industrial trash and municipal refuse into them. Accordingly, Hindu tradition and scriptures warned against actions that degraded environmental purity.

A seminal decision on environmental law and municipal garbage management was handed down by India's apex court in the “1995 case of Almitra H. Patel v. Union of India. An environmental activist named Almitra Patel brought attention to the inadequacy of Municipal Solid Waste management in Indian cities via a Public Interest Litigation (PIL)” filed at the country's apex court. The petitioners brought attention to the dirty circumstances and environmental damage that result from the wrong way to dispose of and handle garbage in urban areas. The petitioner said that local governments were in violation of their constitutional duties by failing to provide a safe and healthy environment for their citizens.

Poor solid waste management poses serious threats to human health and the environment, as the Court has acknowledged. A committee was established by the “Supreme Court of India to establish standards and recommendations for the management of municipal solid waste in India. The group reports to the Ministry of Environment and Forests (MoEF)”. The result was the 2000 “Municipal Solid Waste (Management and Handling) Rules”, which outlined procedures for garbage collecting, sorting, storing, transporting, processing, and finally, disposal.[4]

[3] S Singh, 'Challenges in Solid Waste Management in India: An Insight' (2017) 46 Environmental Science and Pollution Research 12247.
[4] AIR 2000 SC 1257.

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2.2 Classification of Wastes[5]

Based on its origin and characteristics, solid waste is categorized into many types-"Household, institutional, agricultural, biomedical, municipal, and industrial trash are the many categories of solid waste. Solid waste, on the other hand, might be organic, inorganic, biodegradable, non-biodegradable, toxic, or non-hazardous, depending on its property". "Plastic, radioactive, sewage, mining, and rubbish ash" waste are some more types of solid waste.

The management of solid waste has become more important on a worldwide scale over this era, yet many people still fail to put fundamental garbage disposal principles into effect. In many areas all over the world, the public is aware of the serious results of inappropriate practices of solid waste management but then the adverse attitude to implementation gives rise to confusing circumstances. However, a sufficient amount of waste could be reutilized and recycled if separated, following the norms. This could be converted into usable products. A solid waste management system is impacted by technical, legislative, institutional, and unfavourable economic constraints. A consistent service of waste collection is necessary and the vehicles for waste collection need to be suitable for the local situation. It is very essential to involve the public in service plans and policy and also to implement many programs. The participation of the public is essential for the accomplishment of waste management.

"To surround" and "to encircle" are the meanings of the ancient French word "environer," from which the English word "environment" is derived. The term "environment" has a dual definition in the dictionary: (a) the physical environment, particularly that which humans encounter on a daily basis (b) in an ecological context, the external factors that affect the growth and behavior of a living organism.[6]The physical components of Earth are what make up the environment, and humans have a significant role in shaping this environment.

As per "Section 2 (a) of The Environment Protection Act, 1986"-

"*Environment includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro organism and property*".[7]

Environment Sustainability-The need to preserve the world's ecosystems and its natural resources for the benefit of present and future generations is at the heart of sustainability. In "1987, the World Commission on Environment and Development" introduced the term "sustainable development" to describe practices that "meet the needs of present generations without compromising the needs of future generations." This term gave rise to the idea of environmental sustainability.

[5]S.R. Myneni, *Environmental law*151 (Asia Law House Hyderabad 2023).
[6] S.R. Myneni, *International Environmental Law* 1 (New Era Law publication 2020).
[7] The Environment Protection Act, 1986 (Act 40 of 1986), s.2(a)

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Development that satisfies current demands without jeopardizing future generations' capacity to do the same was described as sustainable development.

Meaning and Definition of Municipal Solid Waste-As per "Municipal Solid Wastes (Management and Handling) Rules, 2000 (Schedule, I)" defines Solid Waste "Municipal Solid Waste means garbage or trash consisting of everyday items which we use and throw daily, The things which is used and throw in daily routine and that waste is a municipal waste. In this waste bio-medical waste is treated and the hazardous waste is not included".

Definition of Solid Waste as per the Solid Waste Management Rules, 2016- Household, commercial, industrial, catering, and market trash, as well as other non-residential types of trash, as well as sweepings from streets and other public areas, silt from surface drains, horticultural, agricultural, and dairy waste, as well as treated "biomedical waste (not including industrial waste), biomedical waste, e-waste, battery trash, radioactive waste" produced by entities under the jurisdiction of local authorities, and so on all constitute solid waste.[8].

Laws dealing with solid waste management in India- "The Constitution of India, Laws of Torts, Code of Civil Procedure, 1908, Bharatiya Nyaya Sanhita (BNS), 2023, Bharatiya Nagrik Suraksha Sanhita (BNSS), 2023, Water (Prevention and Control of Pollution) Act, 1974, The Air (Prevention and Control of Pollution) Act, 1981, Environment Protection Act, 1986, Municipal Waste (Management and Handling) Rules 2000, 2016.

3. IMPACT OF SOLID WASTE ON ENVIRONMENT

Wastes up to billions of tons are produced on a worldwide scale. Trying to figure out how different kinds of trash affect the ecosystem is a huge challenge. Something that doesn't pose a threat now can be deemed such later. Dumping trash in an unregulated manner is bad for the environment and makes a mess. The primary ways in which trash harms the environment are:

3.1 Solid Waste and its effect on Air

Over 99 per cent of the world population is exposed to polluted air. The pollution of our atmosphere arises from human activities, about 50 per cent of waste is not managed properly and this mismanagement leads to open dumping and burning. Gases including sulfur dioxide, carbon monoxide, nitrogen, and others are produced by solid waste. A prominent cause of air pollution is the smoke from the waste sites. People in the surrounding surroundings may feel the effects on their health. Cardiovascular disease and respiratory issues become more common in this population.

[8] Paramjit Jaswal, *Environment Law* 545 (Allahabad Law Agency 2021).

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3.2 Solid Waste and its effect on Water:

Chemical or physical substances that are known to affect aquatic life are known as water pollutants. Chemical dangers including lead, phosphate, copper, manganese, and others fall into this category. Because it affects people's health, groundwater shouldn't have any chemical or physical contaminants. For domestic and drinking needs, the locals in and around the waste site rely on the groundwater. Water pollution occurs as a result of garbage dumping and leaks from landfill sites caused by uncollected and mismanaged solid waste.[9]

3.3 Effect on Soil and landscape:

Soil physio-chemical and biological properties are susceptible to change as various wastes settle on it. The soil's fertility is negatively impacted. Due to an inadequate system for waste disposal, trash accumulates on roadways. People impact not just themselves but also the society as a whole when they clean their homes yet leave rubbish in their near vicinity. The scenery is degraded every year due to the dumping of numerous tons of solid trash along roads and other locations.

4. CONCLUSION AND SUGGESTIONS

Environment degradation is a serious problem. Human littering has caused the once- clean and healthy environment to deteriorate. MSWM has become a critical environmental and public health concern in India, due to rapid “urbanization, population growth and inadequate waste management practices”. There is a landfill in a residential area; the site is just 800m away. Residents bear with the foul smell and are facing breathing issues and many elderly people are complaining of a burning sensation in the eyes. The waste flows in water by which the quality of ground water has also been affected. Solid waste laws are enacted to enhance solid waste management and control disposal practices that negatively impact the “environment, public health, and the economy”.

Suggestions-

“Poor waste management and its effects on human health and the environment will persist in India unless these basic needs are addressed”-

- Ensuring households and businesses categorize waste into wet, dry, and hazardous types to facilitate efficient processing and reduce landfill dependency.
- Establishing local composting and recycling units to minimize waste transportation and environmental harm while encouraging community participation.
- Educating citizens through media, schools, and local events on the environmental and social benefits of waste segregation.

[9] Sunil Kumar, 'Challenges and opportunities associated with waste management in India' (2017) 4(3) RSOS 146.

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- Rewarding compliant individuals and businesses with financial or non-financial benefits to motivate responsible waste practices.
- Using digital tools to track compliance, ensuring transparency and accountability in waste management systems.

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