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A STUDY ON THE LEGAL FRAMEWORK OF SOLID WASTE MANAGEMENT FOR THE PROTECTION OF ENVIRONMENT IN INDIA

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ABSTRACT

In the earlier days, the disposal of solid waste did not pose a significant problem because the population was less and the amount of land available for the dumping of solid waste was large but with the increasing population the solid waste management has become a major task for the municipal authorities and the other local bodies. The improvement in the people's living standards because of the Industrial Revolution and Economic Development has entirely changed the methods of solid waste disposal and created extreme complexity in the disposal of the waste. The local bodies are also responsible for supervising the sanitation facilities and public health and for the proper disposal of solid waste. The solid waste management system in India covers the cycling of waste from the waste generated, collecting the waste and the proper transportation and disposal of solid waste. The primary objective of the study is to analyse the legal framework for the disposal of solid waste. The methodology of the study in Empirical research through a convenient sampling method with a total sample size of 210 responses. The study analyses the various challenges faced in the disposal of solid waste and the role of government in the proper disposal of solid waste. The findings of the research are that the rapid alteration of lifestyle have resulted in the increase of waste such as municipal solid waste from fruit and vegetable markets, gardens and parks, construction and demolition waste etc,. The role of government in the management of solid waste is also increasing and the government has to bring in new rules and regulations.

KEYWORDS:-Waste Management, Solid Waste, Municipal Solid Waste, Plastics, Environment.

INTRODUCTION

The natural resources of the planet are not enough to support the human demand and their increasing economic activities. Solid waste can be defined as the unwanted or the unusable solid waste generated from the human activities in their residential area, laboratories and hospital etc. India faces major environmental challenges associated with the generation of the waste and its inadequate disposal methods. The current methods of solid waste disposal systems do not cope with the increasing volume of waste generated by the increasing urban population. With the rapid increase in industrialisation and population explosion, many people have started migrating from the village to the cities, which leads to the generation of greater amounts of municipal solid waste. The improvement in the people's standard of living due to the rapid Industrial revolution and Economic development has entirely changed their consumption patterns and created an extreme complexity in the solid waste management. This alteration in the lifestyle of the people has brought a tremendous increase in the inorganic

constituents in the waste due to which the solid waste disposal system has also been largely affected. Moreover there has also been a rapid increase in the industrially manufactured materials such as “metals” , “glass” , “plastics” and “papers”. There are also other waste being generated such as solid waste from fruits and vegetable, Play areas, street sweepings from the domestic areas and commercial sectors, construction and demolition waste from stones and bricks, reinforcement steel, and infrastructure-building activities, biomedical waste from used/expired drugs and medical instruments, tissues and organs generated from hospitals and various other establishments. An effective strategy for managing waste has to begin with the segregation of solid waste at the source of generation and the different solid waste must be treated appropriately, which leads to the reduction in the residual waste. The behaviour of the consumers is also becoming worse these days as they are not being adapted to the method of segregation of organic or biodegradable waste from the other waste at the beginning level of it being generated. Once the sorting out of the solid waste is done, the next process of it being decentralised is begun with the help of compost and various other gases must be done so that it reduces the burden of transportation for long distances and also reduces the greenhouse gas emissions. The need for a robust legal framework for solid waste management in India is underscored by the constitutional provisions that mandate environmental protection. India's Constitution, in its Directive Principles of State Policy, places a fundamental duty on the State to "protect and improve the environment and to safeguard the forests and wildlife of the country." This duty is reaffirmed by various judicial decisions, including the landmark case of M.C. Mehta v. Union of India, which recognized environmental protection as a constitutional mandate. India's commitment to international agreements and conventions also aimed at environmental sustainability. The Stockholm Declaration of 1972, the Rio Declaration of 1992 have set forth clear principles and objectives for sustainable waste management. Moreover, waste management in India is governed by plenty of national and international rules and regulations, policies, and guidelines. The Municipal Solid Wastes (Management and Handling) Rules, 2000, and the subsequent amendments in 2016, mark a significant milestone in the regulatory landscape. These rules have laid down a comprehensive framework for the management and handling of municipal solid waste, emphasising segregation at source, collection, transportation, and disposal. The adverse environmental impact of inadequate waste management is visible in the form of air, water, and soil pollution. Landfills and dumpsites, when not properly managed, can contaminate groundwater and nearby water bodies, posing a significant risk to aquatic life and human health. The decomposition of organic waste in landfills generates methane, a potent greenhouse gas that contributes to climate change. Additionally, waste burning, which is a common method for waste disposal in India, releases harmful pollutants into the atmosphere, including particulate matter, dioxins, and heavy metals. This practice exacerbates air pollution, leading to respiratory problems and other health issues, particularly in urban areas. Despite the legal and constitutional mandates and the existence of regulatory frameworks, the current state of solid waste management in India leaves much to be desired. The nation's urban centres often struggle with overburdened landfills, unregulated dumpsites, and inadequate collection and transportation systems. Rural areas, though less populated, also face challenges in waste management, although of a different nature. Open dumping of waste remains a common practice, leading to environmental pollution and public health concerns. The unsanitary conditions of these dumpsites are fertile grounds for disease vectors, contributing to the prevalence of diseases in neighbouring communities. The existing practices are not only detrimental to

the "environment" but also result in the wastage of valuable resources. In India, a significant portion of waste is recyclable or compostable, but the lack of effective segregation and recycling mechanisms often leads to the loss of these resources. This also signifies the failure of the current system to promote the principles of a circular economy, which is essential for sustainability.

OBJECTIVES

- To examine the existing management of solid waste practices and its infrastructure including the collection, transportation, treatment and disposal.
- To investigate the environmental consequences of the solid waste management system.
- To analyse the legal framework governing the solid waste management.
- To assess the various consequences and challenges faced in the disposal of the solid waste.
- To evaluate the effectiveness of current management of waste laws on the basis of compliance and enforcement.

REVIEW OF LITERATURE

(Daniel Hoornweg, 2012) The one service that almost every city government offers to its citizens is solid waste management. Although there are wide variations in service levels, costs, and environmental effects, solid waste management is perhaps the most significant municipal service and is a requirement for other municipal actions. One of the most significant byproducts of living in an urban environment, municipal solid waste (MSW), is increasing at a rate that is faster than urbanisation as the world rushes toward an urban future. **(Sonil Nanda, 2021)**The top three nations that produce municipal solid waste are the United States, China, and India. Income has an impact on the composition of solid wastes. People with low to middle incomes produce more organic wastes, while people with high incomes produce more waste paper, metal, and glass. Municipal solid waste can be managed by landfilling, composting, burning, recycling, or converting waste to energy. In many cities throughout the world, landfilling is the preferred method of disposing of solid waste. Waste undergoes physical, chemical, and biological transformations in landfills, which function as ecological reactors. **(George Tchobanoglous, 2009)** Proper management of solid waste is a continuous concern for all municipalities, corporations, and individuals, and it should be given serious attention due to aesthetic, land-use, health, water pollution, air pollution, and economic factors. The continuous and uncontrolled disposal of solid waste, coupled with the malfunctioning collection system, within a densely populated community for a duration of two to three weeks, would inevitably give rise to numerous issues. The presence of offensive smells, buzzing flies, scurrying rats, crawling roaches, chirping crickets, stray dogs and cats, and occasional fires would undoubtedly eradicate any lingering uncertainty about the crucial significance of effective solid waste management. Managing solid waste is a intricate process that encompasses a wide range of technologies and disciplines. Technologies encompassed in waste management involve the entire life cycle of solid waste. This spans the generation phase, which incorporates strategies like source reduction, as well as on-site handling, storage, collection, transfer, transportation, processing, and finally, disposal. **(Silpa Kaza, 2018)** There is not a single individual on this planet who remains unaffected by the impact of solid waste management. It is projected that by the year 2050, waste production worldwide will increase by 70 percent, reaching 3.40 billion tonnes of waste per year, compared to the 2.01 billion tonnes of waste generated in 2016. The choices made by individuals and governments when it comes to consumption and waste management have a significant impact on the overall well-being, efficiency, and hygiene of communities on a daily basis. The world's

oceans are being contaminated due to the poor management of waste. This contamination is resulting in clogged drains and causing flooding, thereby posing a threat to public health. Moreover, the transmission of diseases is being facilitated by this mismanagement. Additionally, the consumption of waste by animals, who are unaware of its harmful effects, is causing harm to their well-being. Lastly, the mismanagement of waste is negatively impacting economic development. The urgency for action on unmanaged and mismanaged waste resulting from years of economic growth is imperative for all segments of society. **(Peter Asnani, 2006)** Solid waste management is a fundamental service offered by local authorities in the nation to ensure cleanliness in urban areas. On the other hand, this service falls under the category of the least well-executed ones in the range. The methods utilized lack scientific basis, are outdated, and prove to be inefficient. Additionally, the service's reach is limited, leaving out a significant portion of the population, and it tends to neglect the poor, pushing them to the fringes. Unsanitary living conditions prevail due to the widespread littering of waste. The current laws regulating urban local bodies fail to adequately address the escalating issue of solid waste management. As urbanisation continues to advance, the scenario is reaching a critical level. According to the 2001 Census, there has been a remarkable increase in the urban population, which now stands at 285.35 million people - a fivefold growth within the past six decades. **(Laura Thomas, 1999)** In this paper, we will discuss the general patterns surrounding solid waste management in Asia. This text solely emphasizes waste management within urban environments. The analysis of the study examines the patterns and offers initial recommendations for mitigating the effects of these patterns. In this paper, we explore the issues surrounding the environmental impact of solid waste management and the financial strain it poses on local government budgets. **(Ashok Shekdar, 2009)** Solid waste management has always been an integral aspect of every human society. When it comes to SWM, the approaches adopted ought to align with the characteristics of the particular society in question, and this holds true even for Asian nations. To align with global trends, the systems are shifting their focus towards sustainability concerns, primarily by integrating technologies that promote the 3R principles of reducing, reusing, and recycling. The degree and nature of improvements towards sustainability, however, vary and are contingent upon the economic status of a country. Countries with high income, such as Japan and South Korea, have the financial capability to invest more in integrating 3R technologies. The current emphasis is primarily on achieving "Zero Waste" and/or "Zero Landfilling." However, these goals pose a hefty financial burden for less robust economies like India or Indonesia. In order to accurately evaluate the anticipated outcomes of SWM (solid waste management) systems in Asian countries, there arises a requirement for a pragmatic assessment. **(Renbi Bai, 2002)** In this paper, an overview of Singapore's current state of solid waste management is presented, along with a brief discussion on the challenges that lie ahead. Singapore, despite its petite size, is a city-state nestled on an island. This bustling metropolis is home to a considerable number of residents, an agreeable warm climate, and substantial levels of humidity. In the last few decades, rapid industrialization and economic growth have resulted in a significant rise in the production of solid waste. **(K Sasikumar, 2009)** The need of the hour is to ensure the safe and effective management of the solid waste produced by the community, government, and commercial institutions. In this concise book, one will find a comprehensive guide on preventing, reducing, and handling solid waste. The book also delves into various models that have the potential to effectively resolve the existing issues related to solid waste. This text explores different sources of waste generation, the composition of solid waste, and the importance of creating a well-thought-out plan

for managing solid waste. This text emphasises the significance of public engagement and awareness in the management of solid waste, while also providing an overview of the solid waste management hierarchy. **(Subhash Anand, 2010)** For several decades, solid waste management in developing countries has unfortunately been overlooked. Currently, this matter has become a part of our everyday lives and affects every single individual in the country. The management of solid waste encompasses the complete set of activities involved in handling waste, starting from its creation until its ultimate disposal. In the present day, one of the primary objectives for urban local bodies is effectively handling the vast amount of municipal solid waste in order to uphold environmental sustainability and protect public health. When thinking about waste management, it can be understood as the field that deals with recognizing, lessening, stashing, gathering, transporting, reusing, recycling, and properly handling and getting rid of garbage in a sustainable way. Furthermore, it encompasses a comprehensive range of solutions to the issues, encompassing administrative tasks, legislation, planning, financial aspects, and engineering functions.

METHODOLOGY

The method of research followed is Empirical research. The sampling method was taken in a convenient sampling method and the sample size of the research is 210 samples. The sample frame was collected in a public area in and around Poonamallee, Chennai. The independent variables are Age, Gender and Place of residence. The dependent variables are The most significant environmental challenges associated with solid waste management in India. The statistical tools used are Clustered Bar Graphs and Pie Charts.

DATA ANALYSIS AND INTERPRETATION

FIGURE 1

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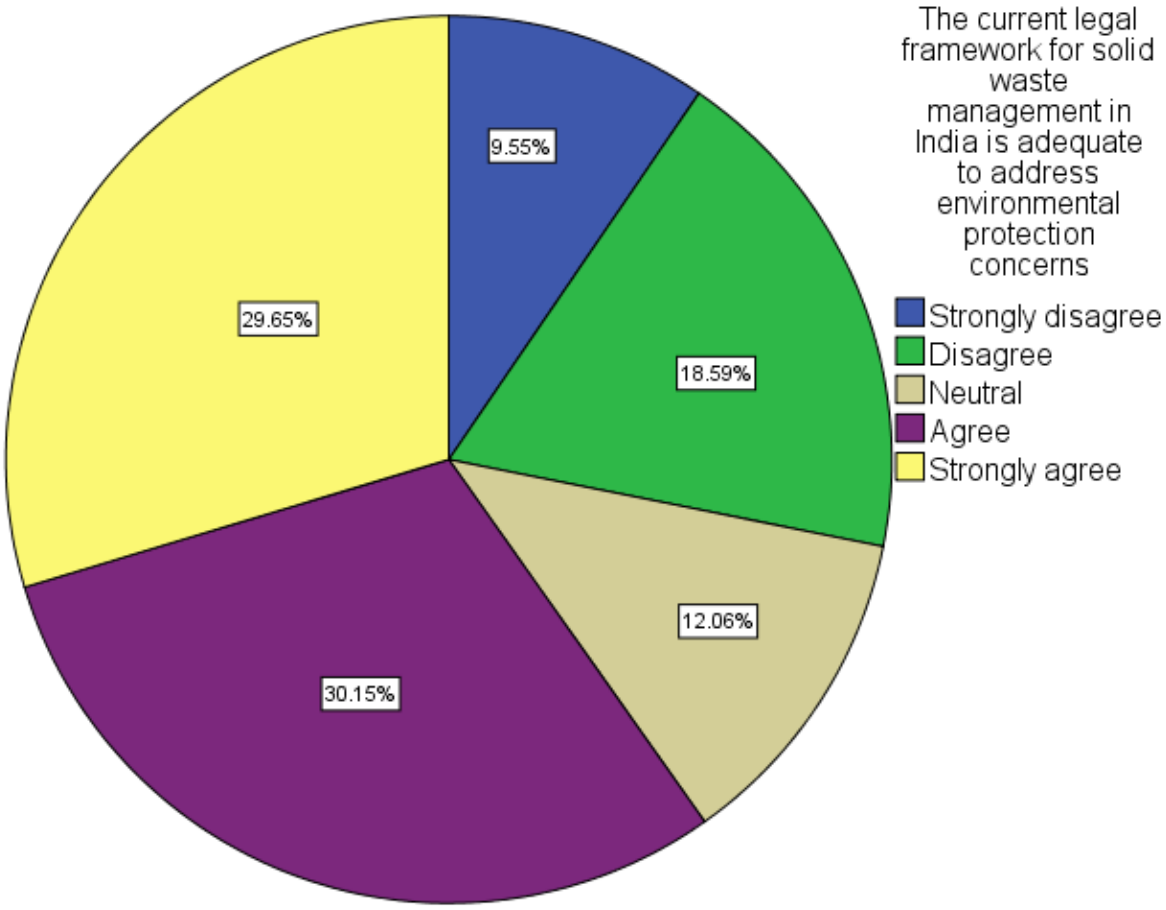
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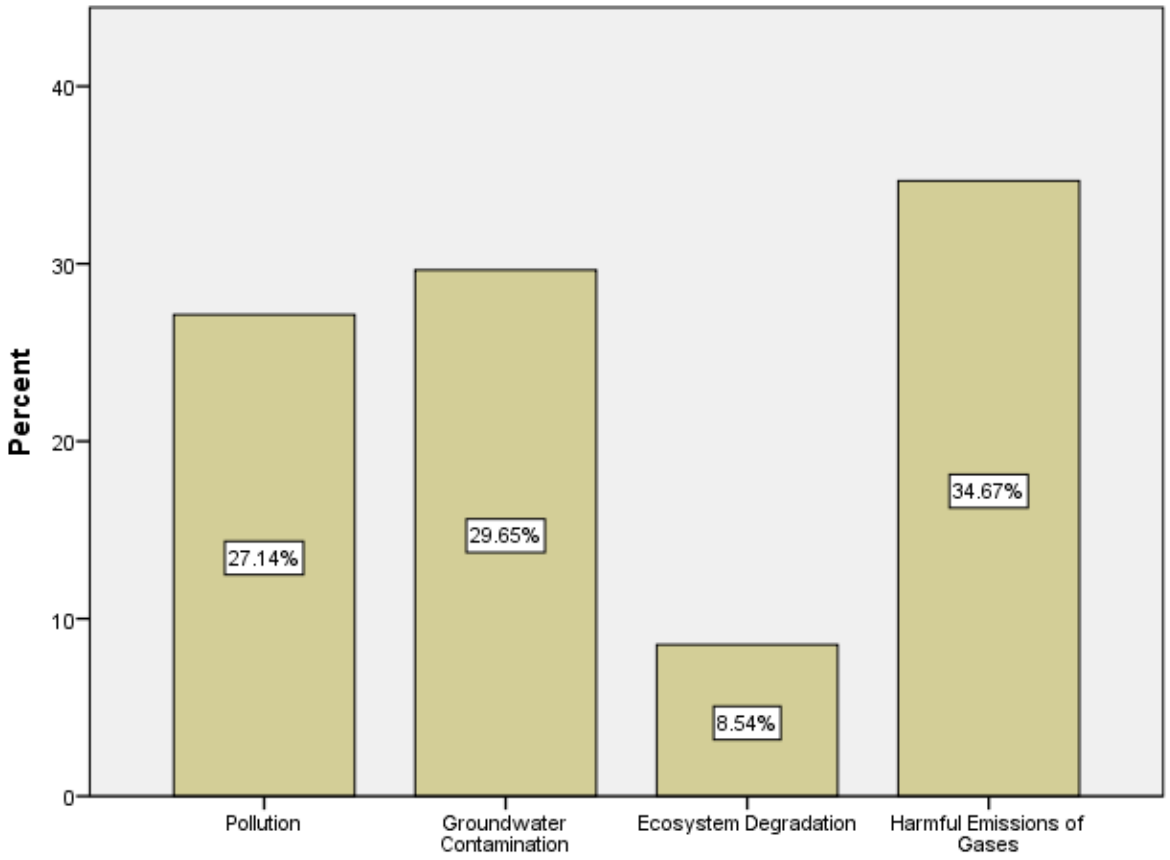
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LEGEND: The pie-chart depicts the agreeability of the statement "The current legal framework for solid waste management in India is adequate to address environmental protection concerns".

FIGURE 2

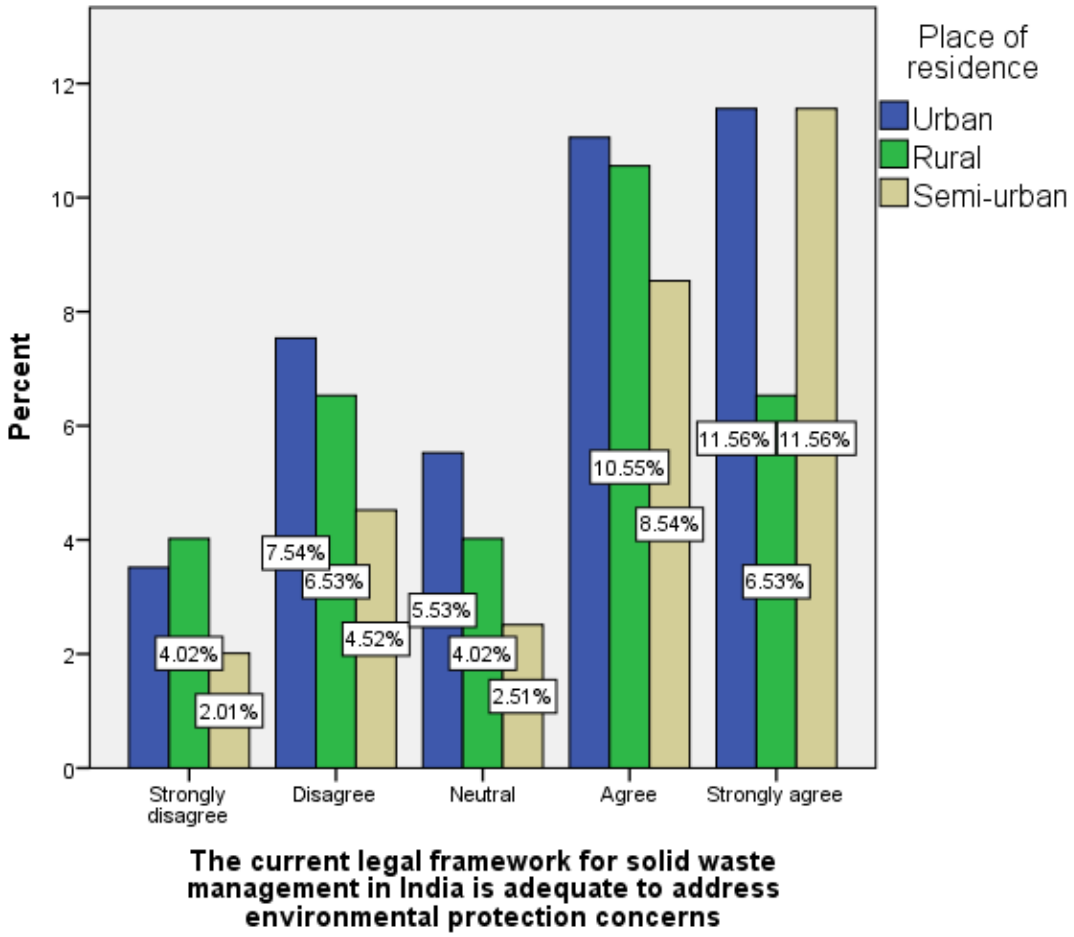
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LEGEND: The above graph represents the most significant environmental challenges associated with solid waste management in India.

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FIGURE 3



LEGEND: The above clustered bar graph represents the Place of Residence pertaining to the statement "The current legal framework for solid waste management in India is adequate to address environmental protection concerns".

RESULT

In(Figure 1) 29.65% strongly agree, 30.15% agree with the statement whereas 18.59% disagree and 9.55% strongly disagree with the statement and 12.06% of the respondents gave neutral opinion to the statement The current legal framework on the management of solid waste in India is adequate to address environmental protection concerns. **In(Figure 2)** 34.67% of the respondents say that Harmful Emissions of gases is the most significant environmental challenges associated with solid waste management in India and 29.65% of the respondents say that Groundwater Contamination is the most significant environmental challenges associated with management of solid waste I n India and 27.14% of the respondents say that Pollution is the most significant environmental challenges associated with solid waste management in India and 8.54% of the respondents say that Ecosystem Degradation is the most significant environmental challenges associated with solid waste management in India. **In(Figure 3)** 11.56% of the urban and semi-urban respondents and 6.53% of the rural respondents strongly agree and 10.55% of the urban and rural respondents and 8.54% of the semi-urban respondents agree and 7.54% of the urban respondents and 6.53% of the rural respondents and 4.52% of the semi-urban respondents disagree to the statement and 4.02% of the rural respondent and 2.01% of the semi-urban respondents

strongly disagree to the statement The current legal framework for management of solid waste in India is adequate to address environmental protection concerns.

DISCUSSION

In(Figure 1) The distribution of respondent opinions on the adequacy of India's legal framework for solid waste management is diverse. Approximately 60.8% (29.65% strongly agree and 30.15% agree) perceive the current framework positively, indicating confidence in its effectiveness. However, 28.14% (18.59% disagree and 9.55% strongly disagree) express reservations, suggesting significant concerns about the framework's ability to protect the environment. Furthermore, 12.06% adopting a neutral stance indicates a segment of respondents requiring further information or holding an indecisive view. These differing perspectives emphasise the complex nature of the issue and underscore the need for well-informed policy decisions to address solid waste management and environmental protection effectively in India. **In(Figure 2)** The data reveals varying perceptions among respondents regarding the most significant environmental challenges linked to solid waste management in India. A notable 34.67% point to "Harmful Emissions of gases" as the primary concern, reflecting the apprehension over air quality and health effects. Close behind, 29.65% emphasize "Groundwater Contamination," highlighting the potential hazards to the water supply. "Pollution" is a focal concern for 27.14% of respondents, underscoring the wide-ranging impact on the environment and public health. Meanwhile, 8.54% attribute top significance to "Ecosystem Degradation," recognizing the broader ecological ramifications of waste mismanagement. These diverse perceptions indicate a multifaceted environmental challenge that demands a comprehensive approach to mitigate solid waste's adverse effects. **In(Figure 3)** The breakdown of responses by location shows interesting variations in perspectives on the adequacy of India's legal framework for solid waste management. A higher percentage of urban and semi-urban respondents, 18.09%, express strong agreement or agreement with the statement, underscoring their relatively positive view of the legal framework. In contrast, rural respondents show lower agreement rates, with only 10.55% agreeing. Additionally, urban and rural areas feature a relatively higher percentage of disagreement (11.06%), highlighting their concerns about the effectiveness of the legal framework. These variations underscore the importance of tailoring waste management policies to specific regional needs and ensuring inclusivity in environmental protection efforts.

SUGGESTION

A thorough assessment of the environmental impact of the current management system of waste should be done in different regions of India to assess the pollution levels, land degradation, and their consequences on public health. Also the government must address the issues of environmental justice and equity within the legal framework, ensuring that waste management policies do not disproportionately impact vulnerable or marginalised communities. The local bodies set up by the government must ensure that legal reforms are designed to promote the long-term sustainability of the waste management system, accounting for future challenges and population growth.

CONCLUSION

It is found from the research that the growth of population and the development of India is one of the major issues on the disposal of solid waste. The current situation in India is that it does not have a proper solid waste disposal system and a place to properly dump the waste. There is an urgent need to create awareness and change the awareness of the people towards the solid waste disposal. While the challenges associated with solid waste management in India are profound, there are significant opportunities for transformative change. The nation's ongoing commitment to

sustainable development, as reflected in the SDGs and various national initiatives, provides a platform for action. One of the most promising aspects of change lies in the power of policy and legal reform. A comprehensive and effective legal framework can act as a catalyst for improved waste management practices. International best practices, lessons learned from other countries, and the principles of sustainability and circular economy can guide these reforms. The rapid increase in the waste management industry in India, with its potential for job creation and entrepreneurship, is another avenue for change. Innovative solutions, technology adoption can contribute to a more sustainable and efficient system. Public participation in waste management, coupled with education on responsible consumption and disposal, can significantly reduce the waste generated and promote recycling. By creating a legal framework, India can set a precedent for environmental sustainability, economic resilience and well-being of human beings.

REFERENCE

1. *What a waste: a global review of solid waste management*,Daniel Hoornweg, Perinaz Bhada-Tata, World Bank, Washington, DC, 2012
2. *Municipal solid waste management and landfilling technologies: a review*,Sonil Nanda, Franco Berruti, Environmental Chemistry Letters 19, 1433-1456, 2021
3. *Solid waste management*, George Tchobanoglous, *177-307, 2009*
4. *What a waste 2.0: a global snapshot of solid waste management to 2050*, Silpa Kaza, Lisa Yao, Perinaz Bhada-Tata, Frank Van Woerden, *World Bank Publications, 2018*
5. *Solid waste management*,Peter U Asnani, *India infrastructure report 570, 2006*
6. *What a waste: solid waste management in Asia*, Daniel Hoornweg, Laura Thomas, *The World Bank, 1999*
7. *Sustainable solid waste management: An integrated approach for Asian countries*, Ashok V Shekdar, *Waste management 29 (4), 1438-1448, 2009*
8. *The practice and challenges of solid waste management in Singapore*, Renbi Bai, Mardina Sutanto, *Waste management 22 (5), 557-567, 2002*
9. *Solid waste management*, K Sasikumar, Sanoop Gopi Krishna, *PHI Learning Pvt. Ltd., 2009*
10. *Solid waste management*, Subhash Anand, Mittal Publications, 2010