# INTERNATIONAL JOURNAL FOR LEGAL RESEARCH AND ANALYSIS

Open Access, Refereed Journal Multi Disciplinary
Peer Reviewed

www.ijlra.com

 ISSN: 2582-6433

# DISCLAIMER

 ISSN: 2582-6433

# EDITORIALTEAM

## EDITORS

### Dr. Samrat Datta

*Dr. Samrat Datta Seedling School of Law and Governance, Jaipur National University, Jaipur.Dr. Samrat Datta is currently associated with Seedling School of Law and Governance, Jaipur National University, Jaipur. Dr. Datta has completed his graduation i.e., B.A.LL.B. from Law College Dehradun, Hemvati Nandan Bahuguna Garhwal University, Srinagar, Uttarakhand. He is an alumnus of KIIT University, Bhubaneswar where he pursued his post-graduation (LL.M.) in Criminal Law and subsequently completed his Ph.D. in Police Law and Information Technology from the Pacific Academy of Higher Education and Research University, Udaipur in 2020. His area of interest and research is Criminal and Police Law. Dr. Datta has a teaching experience of 7 years in various law schools across North India and has held administrative positions like Academic Coordinator, Centre Superintendent for Examinations, Deputy Controller of Examinations, Member of the Proctorial Board*

### *Dr. Namita Jain*

*Head & Associate Professor*

*School of Law, JECRC University, Jaipur Ph.D. (Commercial Law) LL.M., UGC -NET Post Graduation Diploma in Taxation law and Practice, Bachelor of Commerce.*

*Teaching Experience: 12 years, AWARDS AND RECOGNITION of Dr. Namita Jain are - ICF Global Excellence Award 2020 in the category of educationalist by I Can Foundation, India.India Women Empowerment Award in the category of "Emerging Excellence in Academics by Prime Time &Utkrisht Bharat Foundation, New Delhi.(2020). Conferred in FL Book of Top 21 Record Holders in the category of education by Fashion Lifestyle Magazine, New Delhi. (2020).Certificate of Appreciation for organizing and managing the Professional Development Training Program on IPR in Collaboration with Trade Innovations Services, Jaipur on March 14th, 2019*

 ISSN: 2582-6433

# Mrs.S.Kalpana

Assistant professor of Law

*Mrs.S.Kalpana, presently Assistant professor of Law, VelTech Rangarajan Dr.Sagunthala R & D Institute of Science and Technology, Avadi.Formerly Assistant professor of Law,Vels University in the year 2019 to 2020, Worked as Guest Faculty, Chennai Dr.Ambedkar Law College, Pudupakkam. Published one book. Published 8Articles in various reputed Law Journals. Conducted 1Moot court competition and participated in nearly 80 National and International seminars and webinars conducted on various subjects of Law. Did ML in Criminal Law and Criminal Justice Administration.10 paper presentations in various National and International seminars. Attended more than 10 FDP programs. Ph.D. in Law pursuing.*

# Avinash Kumar

*Avinash Kumar has completed his Ph.D. in International Investment Law from the Dept. of Law & Governance, Central University of South Bihar. His research work is on "International Investment Agreement and State's right to regulate Foreign Investment." He qualified UGC-NET and has been selected for the prestigious ICSSR Doctoral Fellowship.He is an alumnus of the Faculty of Law, University of Delhi. Formerly he has been elected as Students Union President of Law Centre-1, University of Delhi.Moreover, he completed his LL.M. from the University of Delhi (2014-16), dissertation on "Cross-border Merger & Acquisition"; LL.B. from the University of Delhi (2011-14), and B.A. (Hons.) from Maharaja Agrasen College, University of Delhi. He has also obtained P.G. Diploma in IPR from the Indian Society of International Law, New Delhi.He has qualified UGC – NET examination and has been awarded ICSSR – Doctoral Fellowship. He has published six-plus articles and presented 9 plus papers in national and international seminars/conferences. He participated in several workshops on research methodology and teaching and learning.*

 ISSN: 2582-6433

# ABOUT US

INTERNATIONAL JOURNAL FOR LEGAL RESEARCH & ANLAYSIS ISSN

2582-6433 is an Online Journal is Monthly, Peer Review, Academic Journal, Published online, that seeks to provide an interactive platform for the publication of Short Articles, Long Articles, Book Review, Case Comments, Research Papers, Essay in the field of Law & Multidisciplinary issue. Our aim is to upgrade the level of interaction and discourse about contemporary issues of law. We are eager to become a highly cited academic publication, through quality contributions from students, academics, professionals from the industry, the bar and the bench. INTERNATIONAL JOURNAL FOR LEGAL RESEARCH & ANALYSIS ISSN 2582-6433 welcomes contributions from all legal branches, as long as the work is original, unpublished and is in consonance with the submission guidelines.

 ISSN: 2582-6433

# RETHINKING WASTE – A POLICY FRAMEWORK FOR A SUSTAINABLE INDIA

AUTHORED BY - MS. NAVYA SUSAN KURIAN & MS IRENE MARIYA PRASAD
4th year BA LLB student at CHRIST (Deemed to be University), Lavasa Campus, Pune, Maharashtra, India

## Abstract

As humanity pursues economic and technological development, it leaves behind a trail of waste in its path. For far too long has this problem gone unnoticed that, by the time the world woke up to this issue, it had already dealt its damage. This paper delves into waste management systems across countries, paying particular attention to Kerala, a State in India. Countries such as Singapore and Nepal have systems that are backed by sanction. Germany collaborates with its residents and incentivises them to segregate wastes meticulously. South Korea is said to have a chart that directs segregation of its food wastes, contributing to its "Zero Food Waste" status. There are only seconds left to midnight. Effective waste management is not just an oath, but a necessity to achieve the ambitious targets of the Sustainable Development Goals, highlighting the importance of collective effort. In line with SDGs - (6) Clean water and sanitation, (10) Reduce Inequality, (11) Sustainable cities and communities, (12) Responsible consumption and production. This paper examines the power of collaboration in waste management, in line with the Goals to create a better future. We aim to suggest or formulate a viable model of waste management that could be adopted and adapted pan India. Through collaboration with NGOs such as the Koodambasree, Kerala has already achieved this to a certain extent. We aim to seek inspiration from how indigenous communities in India deal with their biodegradable waste and how it could be adapted to urban and rural settlements. Responsible consumption and mindful waste management can guide us to a sustainable development, thereby leaving something for the future generations. We can contribute to a healthier planet, a more equitable future, and a resilient society by fostering sustainable waste management solutions.

**Keywords**: Waste Management, Citizen participation, NGO Collaboration

 ISSN: 2582-6433

## Introduction

Modern day consumerism is fast paced and relies on convenience. Cheap packaging to maximise profits are common practices engaged by corporates. Everyone has needs, and these needs generate waste. With the sheer size of human population these needs translate into waste, from products consumed to satisfy these needs. With the objective of mass production, cutting costs through packaging was a recourse taken to make these products still affordable.

Concerns on the impact that these wastes have on our planet was only a matter of consideration once a considerable amount of damage was done. Humanity's trait of learning from mistakes is once again exhibited in humanity first making the mistake, and then seeking for all possible means to make amends and prevent further damage. The erasure of flora and fauna, the changing climates and other monumental changes served as wake-up calls that reminded humanity that it is barely a few minutes away from midnight, a fitting expression for the road of no return that we seemed to have been heading towards.

## Research Methodology

Doctrinal research, primarily based on existing literature, government and private entity reports, and data collected from databases such as the World Bank Data and other international reports.

## SDGs Addressed

Through this paper, the SDGs that we have observed in the various waste management practises that we shall further outline in this paper are as follows:

SDG 6: Clean water and sanitation

SDG 10: Reduce inequality

SDG 11: Sustainable cities and communities

SDG 12: Responsible consumption and production

## Unique Models of Waste Management

In the search for diverse waste management practices, a few countries stood out owing to unique systems they had in place to deal with place. These countries, all unique in their own circumstance, adopted waste management practices that work best for them.

 ISSN: 2582-6433

1. Singapore

Being a small country with a hot and humid climate, sanitation and proper disposal of waste plays a crucial role in the prevention of outbreak of diseases. The composition of waste generated within the country is broadly categorised into domestic, industrial and institutional refuse[1]. Part of its Singapore Green Plan and Zero Waste Masterplan, the country has also promoted the 3Rs – reduce, reuse and recycle as the norm for citizens and private entities. Domestic waste and non-domestic waste saw a significant decline in the year 2023.[2]

The Semakau Landfill, located 8km south of Singapore[3] is a project that aims to deal with not only the management of wastes, but also create more land for domestic and agricultural use. A bund acting as a perimeter of around 7km lined with an impermeable membrane and a layer of marine clay holds the landfill in place and prevents the leak of any leachate from the refuse dumped on it.[4] Waste is firstly segregated at the site of generation, whereby recyclables are retrieved for further processing and extension of product life cycle. The rest is sent to be incinerated in Waste to Energy plants, where the heat thereby produced is used to produce steam that would then be used to propel turbine-generators to generate electricity. The remains – such as the ash from the WtE plants and non-incinerable wastes are transported to the Semakau Landfill for final disposal. At the landfill, the ash and non-incinerable waste is unloaded onto landfill cells, which is then levelled and covered with a layer of earth. Trees and other vegetation are subsequently grown on this soil.[5]

In regards to disposal and segregation of solid wastes, citizens, the public and the private sector all take active part[6]. Initially, waste collection was a task taken up by the Environmental Health Department. However, owing to an aging workforce and diffuclty in recruitment of workers, the Ministry of Environment encouraged competition among private entities to take up this task. The Ministry also through SEMAC a subsidiary owned by the ENV further coordinated this task of waste collection. Private waste collectors must obtain a licence from the ENV and

[1] Bai, Renbi, and Mardina Sutanto. "The practice and challenges of solid waste management in Singapore". Waste Management, 22, (2002) : 557–567.
[2] "Waste Statistics and Overall Recycling." *Overview* . July 2, 2024. Accessed November 26, 2024. https://www.nea.gov.sg/our-services/waste-management/waste-statistics-and-overall-recycling.
[3] "Semakau Landfill." *National Environment Agency* . May 29, 2024. Accessed November 26, 2024. https://www.nea.gov.sg/our-services/waste-management/waste-management-infrastructure/semakau-landfill.
[4] ibid
[5] "Overview." *National Environment Agency*. June 21, 2023. Accessed November 26, 2024. https://www.nea.gov.sg/our-services/waste-management/overview.
[6] ibid

 ISSN: 2582-6433

follow guidelines and other 'Code of Conduct' put forward by the ENV.[7]

Singapore has a number of legislations on the management of solid and hazardous wastes, namely – Environmental Public Health Act, and other regulations under the EPHA such as the Environmental Public Health (General Waste Collection) Regulations, Environmental Public Health (General Waste Disposal Facilities) Regulations, and Environmental Public Health (Toxic Industrial Waste) Regulations.[8] Furthermore, legislations are in place to impose a penalty on those who litter. While the landfill is used as a means for disposal of waste, only that which is a remnant of the incinerated ash and that which cannot be burnt are deposited in Semakau.[9]

Semakau Landfill[10]

Waste to Energy Plants[11]

2. Germany

Germany is well known to be a leading country among global efforts to combat waste and is a prime example on waste segregation and citizen participation. This can mostly be attributed to its strong governmental policies and public awareness.[12]

[7] Bai, Renbi, and Mardina Sutanto. "The practice and challenges of solid waste management in Singapore". Waste Management, 22, (2002) : 557–567.
[8] ibid
[9] Bai, Renbi, and Mardina Sutanto. "The practice and challenges of solid waste management in Singapore". Waste Management, 22, (2002) : 557–567.
[10] ibid
[11] "Visit to Waste to Energy Plant." *Go Green SG*. November 19, 2024. Accessed November 26, 2024. https://www.gogreen.gov.sg/visit-to-waste-to-energy-plant/.
[12] Igini, Martina. "How Waste Management in Germany Is Changing the Game." *EARTH.ORG*. April 18, 2022. https://earth.org/waste-management-germany/.

 ISSN: 2582-6433

 [13]

Waste Segregation Guidelines in Germany

Circular Economy and Deposit Refund Scheme.

Not only do government policies incentivise consumers to recycle, but pricing of commodities is done in such a manner as to encourage spending on products that have a recyclable value with the added benefit of the deposit scheme. Furthermore, consumers within the country seem to be inculcated with the mindset to only purchase what is absolutely necessary. Minimalistic consumer trends – with products once bought serving multiple purposes in line with the practice of prolonged product lifespans are a staple element to the country's success.[14] In an effort to use for the longest possible time, manufacturers are encouraged to design products to be resource efficient, durable and upgradable. The vision is to create products that are not merely used once, but that which can cater to many needs. There is also the matter of involving citizens and consumers in the assembly of products – such as household equipment, with the tools accompanied by instruction manuals on its assembly. This also allows for an extended use of the item, as it educates the consumer on parts that make up the object, and leads them to replace and repair such parts as and when the need arises, instead of discarding them.[15] The Deposit Refund Scheme, has achieved massive success in Germany – with an astonishing rate of 98.4% return of product packaging (bottles) since its implementation. By increasing deposit prices on single use products – consumers are incentivised to immediately return such packaging for recycling or disincentivised to purchase such goods altogether. [16]

Circular Economy Act (Kreislaufwirtschaftsgesetz), 2012 – an act which promotes circular economy, with the aim of conservation of natural resources, protection of human health.[17]

[13] ibid
[14] "Sustainability | Strategies." *International matters*. November 26, 2024. Accessed November 26, 2024. https://www.umweltbundesamt.de/en/topics/sustainability-strategies-international-matters.
[15] "Gernany" *Wate prevention country profile,* European Environment Agency, April 2023
[16] Igini, Martina. "How Waste Management in Germany Is Changing the Game." *EARTH.ORG*. April 18, 2022. https://earth.org/waste-management-germany/.
[17] "Circular Economy Act (Kreislaufwirtschaftsgesetz - KrWG)." *Climate Change Laws of the World*. Accessed November 26, 2024. https://climate-laws.org/document/circular-economy-act-kreislaufwirtschaftsgesetz-krwg_7e83.

 ISSN: 2582-6433

Various other international guidelines – such as the EU's Waste Framework Directive also contribute to recycling rates in the country.[18]

3. South Korea

Volume Based Waste Disposal Fee System – an ingenious way to promote recycling. Through this system, households were to pay either on the basis of the size of their bag or on the weight of their bag – the fee for collection of domestic waste. Recyclables could be collected by waste collectors free of charge. Hence, not only did consumers take active part in segregating plastics and other recyclable materials from their domestic waste – it considerably increased recycling rates in the country. The fee paid in this system is also reinvested into waste collection infrastructure.

The system also influenced consumers to opt for products that have minimal packaging – forcing companies to develop a similar strategy to accommodate this change in demand and preference. [19] To further help this process of segregation, pamphlets instructing and classifying waste was made easily available and accessible (in terms of readability) to the general public.

4. Waste Management in Nepal ( Inefficiencies)

Nepal a landlocked Himalayan nation that faces significant challenges with respect to managing to be specific its municipal solid waste as it undergoes a rapid urbanization and changes in demography. The waste management journey of the country mirrors its transition from the traditional, community-based practices to the modern urban waste handling systems. Accordingly, there has been a recent study by the Asian Development Bank[20] in 2013 where it was shown that Nepal generates approx.1,435 of waste daily and urban areas to specific showing a per capita average of 317 gm/ day, highlighting the growing in the magnitude of the waste management challenge. Accordingly, there has been a recent study by the Asian Development Bank in 2013 where it was shown that Nepal generates approx.1,435 of waste daily and urban areas to specific showing a per capita average of 317 gm/ day, highlighting the

[18] Igini, Martina. "How Waste Management in Germany Is Changing the Game." *EARTH.ORG*. April 18, 2022. https://earth.org/waste-management-germany/.

[19] "Microsoft Word - 2권_10_Environment_Municipal Solid Waste Management.docx." February 5, 2017. Accessed November 26, 2024. https://seoulsolution.kr/sites/default/files/policy/2%EA%B6%8C_10_Environment_Municipal%20Solid%20Waste%20Management.pdf.

[20] Asian Development Bank. *Solid Waste Management in Nepal: Current Status and Policy Recommendations.* Manila: Asian Development Bank, 2013. Accessed November 26, 2024. https://www.adb.org/publications/solid-waste-management-nepal-current-status-and-policy-recommendations.

 ISSN: 2582-6433

growing in the magnitude of the waste management challenge.

The evolution of waste management in Nepal is deeply roots to be specific in its cultural and agricultural practices. Traditionally the communities managed their waste through informal systems which is primarily dealing with organic waste that was naturally integrated into agricultural series. But then due to the rapid urbanization and change in the consumption patterns have dramatically transformed both the capacity and composition of the waste.

The composition of Nepal's waste presents unique challenged and opportunities. As it was indicated in the recent years that organic[21] waste constituted 60-70% of the total waste volume, which is followed by plastics from 12-15% and cardboard from 7-9% and in the category of other materials include glass and mental. The high volume of the organic waste give them an opportunity for composting and sustainable waste management practices that could to a very good extend decrease the burden of landfills.

Nepal in the recent years to be specific has made significant strides in waste management. Theres has been an increasing number of community-led initiatives which have been emerged, with local communities forming waste management committees, organizing clean-up drives, and even by promoting recycling and composting. These kind of grassroot level efforts have led to improved waste disposal practices and a reduced environmental impact.

Waste Management Overview and Legislative Framework

Nepal's waste management legislative framework has evolved significantly over the years to specifically to address the growing challenges with respect to waste management rural and urban areas. The cornerstone and primary legislation that Nepal's waste management system is operated is under the Solid Waste Management Act (2011) which provides the fundamental framework and guidelines for waste handling and disposal across the country. This act pointed as a significant departure from the traditional approaches towards waste management through the introduction of the modern concepts such as segregation from source and private sector participation. Also, it empowers the local authorities to take decisive action against improper waste disposal through a system of penalties and other enforcement mechanisms.

[21] Labra Cataldo, Nicolás, Muyiwa Oyinlola, Samip Sigdel, Dori Nguyen, and Alejandro Gallego-Schmid. "Waste Management in Nepal: Characterization and Challenges to Promote a Circular Economy." *Circular Economy and Sustainability* 4, no. 1 (March 2024): 439–57. https://doi.org/10.1007/s43615-023-00283-0

 ISSN: 2582-6433

The strengthening the role of municipalities and rural municipalities in waste management is built upon the foundation of the Local Government Operation Act 2017. It provided the local government with the authority to develop and implement location-specific waste management rules along with that acknowledging that different regions might require different approaches based on their unique circumstances and challenges.

Then the holistic approach to the waste management by integrating with broader environmental protection goals was brough by The Environment Protection Act of 2019. This legislation helped to introduce much stringent requirements for environmental impact assessments before establishing waste management facilities anywhere in the country and set specific standards for waste disposal. And to be particular it emphasizes on the proper handling of hazardous waste, recognizing the growing complexity of waste streams in an increasingly industrialized society.

Despite such legislative strides, the key challenges remain lack of loco-enforcement capacity and lack of better waste treatment infrastructure. Besides, most municipalities are often plagued by financial difficulties that hinder their ability to invest in modern, technologically advanced waste management infrastructures. In many areas, low levels of public education on proper waste disposal practices also tends to limit the efficiency even of the best waste management systems that can be designed.

Legislative Implementation and System Structure

The institutional framework for waste management in Nepal is structured across multiple levels. As it is stated in the World Bank's Urban Development Report (2021), the central government through the Ministry of Urban Development have set certain national policies while municipalities handle local implementation. The creation of the Solid Waste Management Technical Support Center (SWMTSC) has been instrumental in providing technical guidance though the implementation which faces significant challenges.

The government has implemented many kinds of incentive programs which is to encourage private sector participation. These also includes tax benefits for waste management companies

 ISSN: 2582-6433

and subsidies for composting equipment. Which have led to a successful[22] public-private partnerships in waste collection, particularly in urban areas, though rural regions still lag in private sector engagement.

NGOs play an essential role in Nepal's waste management ecosystem. Organizations like Practical Action Nepal and Clean up Nepal have been implemented significant programs. The PRISM project by the EU has been mainly been a successful in integrating informal waste workers[23] into the formal system. These kinds of collaborations have led to improved waste worker safety programs and community awareness campaigns over the years. Nepal faces different challenges due to its geographical and socioeconomic conditions. The World Bank's Nepal Urban Governance and Infrastructure Project has allocated $150 million for municipal infrastructure development, including waste management improvements is stated in World[24] Bank Project Report of 2022.

Over the public awareness about waste management issues have been increased drastically due to the awareness campaigns and educational programs conducted by NGOs, government agencies, and educational institutions. It is also increased awareness which has led to greater public participation in waste management activities even with more people sorting their waste, composting, and recycling.

Keeping in mind the technological advancements which even have also played a role in improving waste management practices in Nepal. The adoption of waste-to-energy technologies to generate electricity from waste and also the development of innovative waste sorting and recycling facilities have significantly contributed to more efficient and sustainable waste management.

[22] Moktan, Pampha, and Ajay Chandra Lal. 2023. "Public Private Partnership in Sustainable Solid Waste Management: A Case of Madhyapur Thimi." Proceedings of 14th IOE Graduate Conference 14 (December). ISSN: 2350-8914 (Online), 2350-8906 (Print).
[23] Practical Action and Centre for Integrated Urban Development (CIUD). 2014. "PRISM – Poverty Reduction of Informal Workers in Solid Waste Management Sector: Final Narrative Report." Contract no. DCI-HUM/2011/236-672. Project report covering five municipalities of Kathmandu Valley. Kathmandu, Nepal.
[24] World Bank. “In Nepal, IDA Is Supporting Local Governments to Drive Development.” Text/HTML. Accessed November 26, 2024. https://www.worldbank.org/en/news/feature/2024/06/07/in-nepal-ida-is-supporting-local-governments-to-drive-development

 ISSN: 2582-6433

The international[25] cooperation has even further supported Nepal's efforts in waste management. Also, partnerships with international organizations and donor agencies have helped to implement sustainable waste management projects, providing financial and technical assistance.

While on one side the challenges do remain such as the[26] inadequate infrastructure, limited financial resources, and lack of public awareness in some areas and on the other side the positive trends and ongoing efforts provide hope for a more sustainable future for waste management in Nepal.

5. India

India faces significant challenges in waste management which is mostly influences by rapid urbanization, population growth and limited infrastructure. The Solid Waste Management6 Rules (2016) mandates segregation of waste at source (wet, dry, and hazardous), collection and discarding/ disposal of waste. These rules are issued by the Ministry of Environment Forest and Climate Change (MoEFCC) which outline the responsibilities for waste management for local authorities, waste generators, and private entities. The rules also require the municipalities to even establish proper waste collection and processing systems

Then The Plastic Waste Management Rules, 2016 these focus on the management of plastic waste specifically the single-use plastics. They have mandated the extended producer responsibility (EPR) for manufacturers who are required to ensure the recycling or disposal of plastic products. The rules aim to reduce plastic pollution by encouraging recycling and promoting alternatives

For E- Waste also there is a specific one which is The E-Waste (Management) Rules, which govern the disposal of electronic waste, ensuring that e-waste is handled in an environmentally friendly and responsible manner. They establish guidelines for the recycling and disposal of electronic products which indeed requires the producers to take responsibility for the collection

[25] Shrestha, Sanjeev. 2016. *A Case Study of Municipal Solid Waste Management in Nepal Compared to the Situation in the European Union and Sweden.* Kathmandu University. https://www.diva-portal.org/smash/get/diva2:971265/FULLTEXT01.pdf.

[26] Shrestha, Sudip, Alok K. Shakya, and Suresh R. Joshi. 2016. "Solid Waste Management: Challenges and Practices in the Nepalese Context." *Waste Management & Research* 34 (12): 1136-1146. https://www.researchgate.net/publication/350194752_Solid_Waste_Management_Challenges_and_Practices_in_the_Nepalese_Context.

 ISSN: 2582-6433

and safe disposal of their products at the end of their lifecycle

Last but the Least the Hazardous Waste (Management, Handling, and Transboundary Movement) Rules, 2016 which deals with the safe management and disposal of hazardous waste by setting standards for their handling, transportation, and disposal. They also ensure that industries do follow the stringent measures to minimize environmental impacts

Even after legislative framework still there is weak enforcement and only a fraction of waste is properly segregated or even recycled. This is the biggest drawback that we face in a beautiful India.

Kerala has been a pioneer in decentralized waste management by focusing on involving the local communities in the waste segregation and composting aspect. This kind of grassroots approach has made an essential impact and a turning point along with programs such as the "Waste-to-Wealth" initiative which encourages the recycling of waste at the household level. The state's decentralized policy emphasizes on reducing waste at source, recycling, and composting while at the same time the Kerala State Solid Waste Management Project (KSWMP) aims to provide centralized facilities for the proper disposal of residual waste.

The Kerala government has launched an incentive program that could engage the private entities and NGOs in the waste management efforts. For example, Kerala Enviro Infrastructure Ltd (KEIL) which has been successfully in operating a landfill for passive waste disposal at Ambalamed. NGOs and local communities have been essential in Kerala's waste management success, promoting public participation and also for creating environmental awareness.

The first Kerala District that put forward their hand with respect to waste management is Alappuzha. The district is also called the Venice of the East is city of around two lakh people that is clubbed between the Arabian sea and Vembanad lake. One of the major factors due to which this got a big hit was due to the community corporation and initiative that they put forward to waste segregation and management.

The water sanitation (Watsan) parks in the city specialize in the unique Thumboormuzhy mode is an aerobic composting method which is a fundamental to the decentralized waste management experiments in Kerala. Initially due to the lone waste disposal site which had to

 ISSN: 2582-6433

be shut down to public protest that is when it pioneered a new experiment which relied more on segregation , decentralization and as it was stated in the beginning community participation. It took for over two years the masses to be taught how to segregate and process the waste through campaigns which was initiated by[27] Zero Waste & Climate Action Program at Thanal which is one of the oldest environmental NGOs in Thiruvananthapuram.

Then Kudambashree[28] which is women self-help group has been a huge success in Kerala and even it is employment for the housewives of rural area to be specific for an independent source of income through the government. Alappuzha embarked on a project called Clean Home, Clean City which focussed on source segregation as the first and the initial step towards effective waste management[29].

If look back Kudumbashree Mission was launched in 1998 as the State Poverty Eradication Mission (SPEM) . Then it got changed to Kudumbashree Mission in 1999 and began functioning under the Local Self Government (LSG) Department of the Kerala Government. The actual meaning of this word is prosperity of the family which is actually true and also helps the upliftment of women. Currently all over Kerala in different district they go and collect the glass bottles one a month along with that they are instructed to collect Rs.50 which to be given to the respective local body and also, they would provide a card to the respect houses to be maintained. So, basically it is the responsibility of the community to collect and segregate the waste and each month they would come and different categories of waste excluding organic ones (as it is made into composite in the houses).

It was recognized by the United Nations Environment Programme (UNEP) for its solid waste management practices in the 2017[30]. Alappuzha was one of five cities in the world that the UNEP recognized who have successfully managed solid waste After this district currently there is Vadakara Municipality in Kozhikode first zero-waste local body in Kerala. It has been known for its out of the box efforts to ensure the efficient segregation and even disposal of waste. Its

[27] Thanal. “Zerowaste and Climate Action.” Accessed November 26, 2024. https://thanaltrust.org/programs/zerowaste-and-climate-action/
[28] Amrith, M., Suresh Appukuttan, and Jayashree Nair. "A Study on Kudumbashree in Kerala." *International Journal of Pure and Applied Mathematics* 118 (2018): 4195-4201
[29] Upadhyay, Aishwarya. “Garbage-Free Cities: What Have These Cities Done Right About Waste Management?” *NDTV-Dettol Banega Swasth Swachh India* (blog), July 28, 2022. https://swachhindia.ndtv.com/garbage-free-cities-what-have-these-cities-done-right-about-waste-management-69828/.
[30] “Solid Approach to Waste: How 5 Cities Are Beating Pollution,” November 22, 2017. https://www.unep.org/news-and-stories/story/solid-approach-waste-how-5-cities-are-beating-pollution.

 ISSN: 2582-6433

role would be converting waste dumping yards in the town into parks had been appreciated widely which again was a success with respect to waste management.

The Solid Waste Management Rules 2016 and all the waste management legislation authority is the Kerala State Pollution Board. In 2023 the imposition of the fines have went up with respect to violation of waste management or even littering of the waste.

Kerala has a unique approach to waste management which combines both decentralized and centralized systems.

Kerala's collaboration with NGOs and its robust waste segregation programs have made it a model for other states in India[31]. Then they also have set up around over 1000 Neighbourhood Groups (NHGs) to manage waste the community level.

The people of Kerala and their willingness to contribute to the community waste management aspect is what is making a huge success.[32]

Indoor (Madhya Pradesh)

In 2016 the Indore Municipal Corporation can with the waste segregation in each and every house hold. Initially people in the community have its own difficulties but over the years it was inculcated to their daily routine[33]. The truck that carries the waste has different compartment to collect the different types of waste from the households[34]. Organic waste is used by the households in the community for themselves to use it has a composite for their plants. Most of the waste is incriminated and the gas which $CO_2$ is used as fuel to run the public transports of the city which in turn make sure that there is no causing of air pollution. Then the ashes of the waste are dumped to a landfill area which the government has reserved. But then the only thing that is common between the Singapore's waste management and Indore is how

[31] Rajeev S.R. "Social Enterprising: Model of Kudumbashree in the End-to-End Process of Solid Waste Management – A Study from Kerala." *International Journal for Research Trends and Innovations* 8, no. 12 (2023), 177-180.

[32] K.C. Shinogi, DUM Rao, Sanjay Srivastava, Dinesh Sharma, Eldho Varghese, and Rashmi I. "Impact of Community-Based Waste Management Effort in the Socio-Economic Upliftment of a Rural Tourism Village in Kerala." *2018*.

[33] Singh, Rasmeet. "Municipal Solid Waste Management in the City of Indore: A Case Study." *International Journal of Environmental Science and Technology* 7 (2021): 8–17. https://doi.org/10.17352/2455-488X.000039.

[34] "Smart City Indore | Solid Waste Management." Accessed November 26, 2024. https://www.smartcityindore.org/solid-waste/.

 ISSN: 2582-6433

to make use of the ashes of the waste materials.

## Issue Identified: Actual Disposal after Segregation.

A standardized waste segregation system implemented in the context of government-provided recyclable and reusable garbage bags is a critical necessity in contemporary waste management. Lessons learned from sophisticatedly designed systems in South Korea and Japan also illustrate how the proper tools and infrastructure transform waste management from a municipal burden into an environmental success story. These countries prove that if appropriate waste disposal means are provided by the government to its citizens, particularly special bags for a specific type of waste, then the whole recyclable ecosystem becomes efficient and sustainable.

Critical connecting link between waste segregation and proper mediums cannot be overstated. For proper segregation at the point of collection fails in case the appropriate containers and special bags related to the type of waste are not provided. When organic waste mingles with recyclables, or hazardous materials contaminate general waste, the entire purpose of segregation is undermined, leading to increased processing costs and reduced recycling efficiency. Once citizens have easy access to bags clearly and purposefully marked as organic waste, recyclables, or general trash, they will participate regularly in the waste segregation program. In addition, such standardized tools help waste collectors quickly identify and handle the various streams of wastes properly, which would avoid wrong wastes to be sorted and reduce processing time at treatment facilities.

This method, coupled with effective waste segregation through proper disposal mediums, produces concrete environmental and economic benefits - it reduces dependence on landfill, increases recycling rates, and minimizes the carbon footprint of waste management operations. While the initial investment in offering the proper disposal tools pays dividends in terms of diminished environmental degradation, lower long-term processing costs, and a sturdier, more sustainable ecosystem for waste management, this is also, in effect, where the government fits in with the facilitation of proper segregation through the offering of disposal tools: making it not only an environmental necessity but a cornerstone to sustainable urban development. But then the disposal of the waste segregation should ensure that each and every category of the waste is recycled or reused and most of the times it is noticed that after segregation they mix up the waste which again defeats the very purpose of waste managment fundamental aspects.

 ISSN: 2582-6433

## Conclusion

By affirming once again that rethinking waste management requires more than a system. It requires or demands a shift in the mindset of the community as well as the government. By weaving Germany's circular economy and deposit refund scheme, South Korea's zero waste commitment along with pay for what you throw and segregation pamphlet, which are followed by the people even though they had difficulty in the beginning, it shows their determination and as well as the government's firmness, Singapore's waste to energy and Semakau landfill, Nepal's commitment towards waste management and last but not the least Kerala's decentralized model and the wisdom of indigenous waste practices like Kundanashree and community willingness, even the Indore municipal dedication to use all the aspect of waste to the fullest efficiently. By integrating these diverse practices into India's fabric, we can create a unique waste management model that fuels sustainability, responsibility, and hope for future generations, showcasing the potential of our diverse country.