

A Bibliometric Analysis of Role of Women in Leading Communities towards Efficient Waste Management

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ABSTRACT

Waste management remains a pressing concern globally, particularly in urban India, where unsegregated waste and expanding landfills pose environmental and health hazards. This study explores the pivotal role played by women in waste management. Women have been primary custodians of domestic waste, a role rooted in traditional practices of societal norms.

Waste management in India has significant contribution of women's collectives and grassroots leaders such as Dr. Almitra Patel and Ms. Jyoti Mhapsekar, who have spearheaded movements for waste management and successful community waste initiatives like Stree Mukti Sanghatna and the SWaCH model in Pune respectively. These examples underscore the potential of women's engagement in transforming waste management systems and creating socio-economic opportunities. However, though women have been an integral part of the waste management system, there are not many women entrepreneurs who have successful large industrial businesses in waste management sector.

*Using a **Systematic Literature Review (SLR)** guided by **PRISMA 2020**, the study analyses relevant papers sourced from the **Scopus** database. Bibliometric tools like **VOSviewer** and **Biblioshiny (R software)** were employed to visualize keyword trends and author influence, since these softwares have a strong visualization capacity and provide ease of use for new researchers over large bibliometric data. The analysis reveals a strong correlation between keywords such as "women", "waste", and "management", and highlights the recurring themes of gendered responsibility, informal sector dominance, and post-COVID challenges in waste handling. This literature review emphasizes the need for change in outlook by women to create a stronger impact integrating themselves more meaningfully into organized waste management systems and to create more successful businesses in waste management sector.*

This study leaves many open questions for further research to bring about a societal change for managing our waste effectively.

Keywords: Women, Waste Management, Landfill, segregation, entrepreneur

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INTRODUCTION

Waste management is a concern that has drawn global attention. Studies have shown the detrimental effects of landfills. Waste which is disposed on the roads creating a pile emitting foul odour becomes a source of infection in a community (*Beyond an Age of Waste Turning Rubbish into a Resource*, 2024; Linzner & Lange, 2013). People living near landfills are exposed to detrimental emissions from the landfill gases, air pollution, groundwater contamination, soil pollution and infections (Goldberg et al., 1999; Turner et al., 2020). Rules have been laid by the government of India in 2016 to segregate the waste at source to tackle the problem of mounting landfills every day (National Green Tribunal, 2016). These rules were implemented by many municipalities and quite a few of them found success in managing their waste efficiently. It has been keenly observed that urban local bodies which found great success in moving their community towards a sustainable waste management solution took help of local women and associated groups created jobs for women including business opportunities in solid waste management (Sasha R, n.d.; Simon-Kumar, 2025; *Wasting Women—the Biopolitics of Waste and Women*, n.d.). The first lady to highlight the menace of waste management in India was Dr. Almitra Patel whose PIL led India to form the base Solid Waste Management rules in 2016. In Maharashtra, Stree Mukti Sanghatna was founded by Ms. Jyoti Mhapsekar who gathered all the women waste pickers and provided better living standards by bringing them into the mainstream of waste management by imparting training on picking up waste bringing it to the collection centre segregation the waste correctly and further recycling the waste. This Sanghatna has changed lives of more than 3000 women till date (Wastewor(l)d Social Entitlements for Waste Pickers Social Entitlements for Waste Pickers, n.d.). In this paper, an attempt to understand the role of women in the business of waste management.

BACKGROUND

The key to a good waste management practise is segregation at source (Morrissey & Browne, 2004; Paul et al., 2020; Sabki et al., 2019). Source of waste in Municipal Solid waste is from the individual houses, residential complexes (Tsai et al., 2020). Handling of garbage is considered to be the responsibility of the lady of the house. Working women manage more household chores as compared to her counterpart. (Mukhter & Chowdhary, 2024; Sweetey et al., n.d.; UNEP, n.d.). When the lady of the

house decides that she will compost her kitchen waste, she reduces the waste going to landfill from her house by 80%. She prevents contamination of the dry waste and helps in recycling the dry waste better.

This paper addresses the question whether the participation of women impacts the waste management of a city, which is addressed through a bibliometric analysis of relevant papers indexed in Scopus, which is one of the largest academic databases (Mengist et al., 2020).. Bibliometric tools such as VOSviewer and Biblioshiny will be utilized to visualize and identify trends in keywords and the most cited authors since these softwares make a better representation than other available softwares for a large database analysis(Aria & Cuccurullo, 2017; van Eck & Waltman, 2010). Previous studies have successfully applied bibliometric analysis to map the participation of women in various other fields of study such as management, entrepreneurship, psychology and marketing.

RESEARCH GAP

A preliminary review of literature showed that there is very little information on the participation of women in waste management. The bibliometric analysis shows that world over women get together to make small groups to improve the waste management of their own respective communities(Asteria & Herdiansyah, 2022; Morrissey & Browne, 2004; Sabki et al., 2019). These groups are mostly localised and run on a not-for-profit model(Linzner & Lange, 2013; Zero Waste Model Ambikapur, Chattisgarh, n.d.). Bringing women into the mainstream of waste education programs streamlines the local waste management(dos Muchangos & Vaughter, 2019). Cities like Ambikapur, Pune, Bangalore, Dhaka, Karang Resik, Tasikmalaya, West Java, Indonesia have benefitted from including these self help groups into the mainstream of waste management.(Asteria & Herdiansyah, 2022; dos Muchangos & Vaughter, 2019; Estrada et al., 2023; Morrissey & Browne, 2004; Mukhter & Chowdhary, 2024; Sweety et al., n.d.; UNEP, n.d.; Wasting Women—the Biopolitics of Waste and Women, n.d.; Zero Waste Model Ambikapur, Chattisgarh, n.d.)

The presence of women in leadership roles can be illustrated by the examples in the following table. Some of the women leading in different industries in India are shown in the Table along with the segment they cater to.

Industry Segment	Examples of Women Leaders	Leadership Role Trends	Key Insights
Manufacturing & Engineering	- Mallika Srinivasan (Tractors and Farm Equipment Ltd.)	Low representation in heavy industry	Women thrive in mid-size manufacturing and are slowly entering core engineering fields
	- Revathi Advaiti (Flex Ltd.)		
Pharmaceuticals & Biotech	- Kiran Mazumdar-Shaw (Biocon)	Strong leadership in R&D-based firms	High visibility due to STEM backgrounds and entrepreneurial drive
	- Dr. Swati Piramal (Piramal Group)		
FMCG & Consumer Goods	- Priya Nair (HUL),	Growing executive representation	Women excel in brand strategy and consumer engagement. Leading cosmetic brands.
	- Falguni Nayar (Nykaa)		
	- Vineeta Singh (Sugar Cosmetics)		
Healthcare & Hospitals	- Dr. Preetha Reddy (Apollo Hospitals)	Family-led enterprise growth	High representation in hospital admin, wellness, diagnostics
	- Sangita Reddy (Narayana Health)		
Banking & Finance	- Naina Lal Kidwai (HSBC)	Historically strong	BFSI sector actively promotes gender inclusion at leadership level
	- Arundhati Bhattacharya (SBI)		
	-Renu Sud Kaarnad (HDFC)		
	-Shanti Ekambaram (Kotak Mahindra Bank)		
Education & EdTech	- Byju's, Vedantu have female CXOs	High representation in both traditional and online education	Women lead policy, pedagogy, ed-tech innovation
	- Dr. Indu Shahani (ISDI, Mumbai)		
Environment & Sustainability	- Sunita Narain (CSE)- Rhea Singhal (Ecoware)	Emerging space	Women lead in policy advocacy, waste management, green product startups
	- Almitra Patel (SWM Policy)		
	- Jyoti Mhapsekar (SWM)		

Industry Segment	Examples of Women Leaders	Leadership Role Trends	Key Insights
Logistics & Supply Chain	- Rashmi Daga (FreshMenu)	Underrepresented	Rising in tech-driven logistics, last-mile delivery, health logistics
	- Meena Ganesh (Portea)		
Technology & IT	- Debjani Ghosh (NASSCOM)	Still male-dominated	Growing through STEM pipelines, CXO roles in MNCs
	- Roshni Nadar (HCL)		
	- Neelam Dhawan (HP, IBM)		
Infrastructure & Construction	- Manju Bharat Ram (Shriram Group)	Very low leadership share	Barriers due to capital intensity, legacy ownership
	- Mini Menon (Invest India infra team)		
Real Estate & Urban Development	- Irani Chatterjee (Godrej Properties)	Limited but rising	New women-led architecture and green building firms emerging
	- Nandini Piramal (Piramal Realty)		
Consulting & Strategy	- Nivruti Rai (Intel India)	High in knowledge-intensive segments	Women are gaining ground in ESG, DEI, sustainability consulting
	- Vanitha Narayanan (IBM India)		
Media, Arts & Advertising	- Ekta Kapoor (Balaji Telefilms)	Strong presence	Creative fields have high entrepreneurial and CXO roles for women
	- Anupriya Acharya (Publicis Groupe)- Barkha Dutt (Media)		
E-commerce & Startups	- Falguni Nayar (Nykaa)	Rapidly growing	Women are driving consumer-centric platforms in Tier 1 & Tier 2 markets
	- Richa Kar (Zivame)		
	- Suchi Mukherjee (Limeroad)		
Aerospace & Defence	- Tessy Thomas (DRDO)	Niche but impactful	Women are in research and command roles rather than entrepreneurship
	- Shobhana Bhartia (Hindustan Times Aerospace Desk)		

Table 1 Different Industries where women play a leading role
(Source: Internet search)

RESEARCH OBJECTIVE

Literature review shows women are actively involved in waste management initiatives in the society. They form self-help groups and are encouraged to recycle the products through a cottage industry model. The self-help groups can manage only recyclable waste which can either be recycled or repurposed. However, scaling up of an industry becomes difficult as consistency of household waste differs with time and festivities. Waste segregation being one part of the problem, treatment of waste and role of women in treatment of waste is studied through SLR.

SYSTEMATIC LITERATURE REVIEW

A systematic literature review (SLR) was conducted to review and consolidate research on data on the primary objective of role of women in waste management.

Scopus was selected as the primary database for article review since it is considered as one of the largest citation bases. The choice of Scopus was made because:

1. Large Coverage: Scopus provides extensive coverage of high impact journals in the field of environment, waste management and issues related to women and entrepreneurship in different fields Scopus includes a large number of articles related to the topic being discussed and therefore it was highly suitable for the review.
2. Compatibility with Analytical tools : Biblioshiny(R Software) and VOS viewer, both support Scopus data base, making it easier to analyse and represent the data.
3. A single database like Scopus minimises inconsistencies if any along with human error associated with merging data from different databases, which often presents results in varying formats.

The study followed the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency and replicability of the research process (Aria & Cuccurullo, 2017; Donthu et al., 2021; Heitor, 2015; Mengist et al., 2020; van Eck & Waltman, 2010). PRISMA was adopted to systematically filter articles through a multi-step selection process. Articles from academic journals, reviews, Trade publications, Conference Materials, reports, Literature reviews and Primary Source

documents were included in the search. The database search involved using a combination of keywords related to the role of women in waste management such as “Women, Waste management, Segregation, Household, Landfill, Responsibility, Waste”.

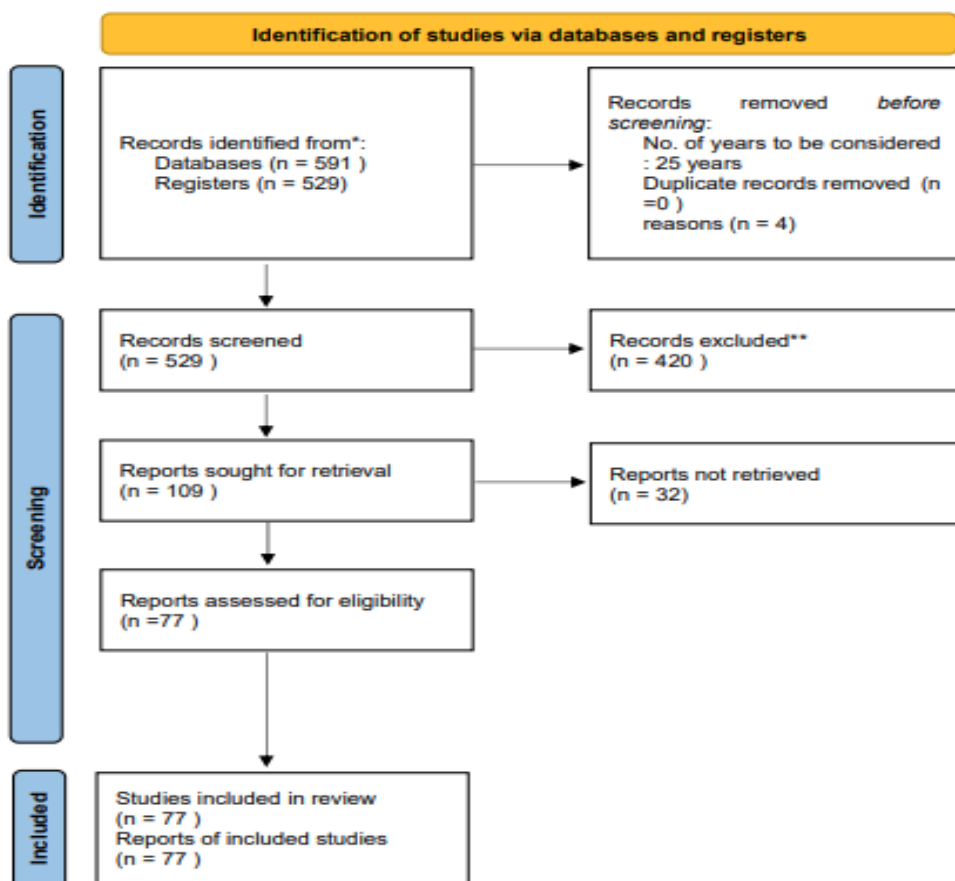


Figure 1 : PRISMA-2020 from SCOPUS database



Figure 2: Main Information

The factorial analysis plot maps key terms from the literature into a two-dimensional semantic space, explaining **83.87%** of the variance along Dimension 1 and **8.64%** along Dimension 2. This high cumulative variance suggests strong interpretability of the keyword structure. The left side of the graph (negative Dim 1) shows keywords like “women’s status,” “municipal solid waste,” “environmental health,” and “waste management”, reflecting a community- centric and policy-focused cluster, especially from regions like India, where these issues intersect with gender and governance. These terms are more aligned with social infrastructure, service delivery, and empowerment in waste management.

In contrast, the right side (positive Dim 1) is dominated by clinical and demographic themes such as “female,” “male,” “adolescent,” “young adult,” “human experiment,” and “controlled study.” This indicates a separate, medically inclined body of literature examining occupational exposure, age, and health impacts in waste handling roles—especially in developing countries.

Positioned near the center are bridging terms like “waste disposal,” “recycling,” “education,” “developing countries,” and “perception,” indicating their interdisciplinary nature and relevance across both policy-driven and clinical research domains.

Overall, this factorial structure shows two dominant axes:

1. A social-policy-development axis (left)
2. A clinical-demographic-health axis (right)

The chart underscores that research on women in waste management spans across **governance, sanitation practices, environmental health, and socio-demographic studies**, but these domains remain somewhat siloed, indicating opportunities for more integrated research. This study will serve as a gap analysis statement in an interdisciplinary study where role of women in the domain of waste **management** will be discussed.

Analysis of the metadata from Biblioshiny (Figure 6) shows an Excellent status for Abstract, Author, Document Type, Journal, Language, Publication year, Title and total Citation. This indicates that all the documents considered for the SLR have a well structured and complete Abstract written, which ensures rich textual data content for analysis, keyword extraction and topic modelling. The author names and affiliations are

consistent and completely recorded, supporting robust author productivity, collaboration network and citation impact analyses. Document types (eg. Article, review, conference paper) are correctly and consistently tagged allowing reliable filtering, comparison and trend analysis across publication formats. Each document is properly linked to a recognized journal with complete metadata (eg. Name, ISSN number, publisher). This is critical for journal impact analysis and source clustering. This means that the dataset chosen is reliable and ready for advanced analysis such as co-citation, keyword co-occurrence or thematic evolution. It will potentially yield accurate visualisations and statistical insights in tools chosen for SLR and we will be able to draw conclusions on trends, patterns and research impact with fewer metadata gaps.

Metadata	Description	Missing Counts	Missing %	Status
AB	Abstract	0	0.00	Excellent
AU	Author	0	0.00	Excellent
DT	Document Type	0	0.00	Excellent
SO	Journal	0	0.00	Excellent
LA	Language	0	0.00	Excellent
PY	Publication Year	0	0.00	Excellent
TI	Title	0	0.00	Excellent
TC	Total Citation	0	0.00	Excellent
C1	Affiliation	3	1.83	Good
CR	Cited References	3	1.83	Good
DI	DOI	10	6.10	Good
DE	Keywords	17	10.37	Acceptable
RP	Corresponding Author	28	17.07	Acceptable
ID	Keywords Plus	48	29.27	Poor
WC	Science Categories	164	100.00	Completely missing

Figure 7: Meta data from Biblioshiny

“Good” affiliation indicates most of the records have all the data filled in correctly which enables us to make a reasonable analysis of institutional and geographic productivity. Some documents may lack full affiliation data eg. A missing university or department name or country code. “Good” Cited references means most of the documents include a well structured reference list and a citation based analyses such as most cited authors, sources and documents is possible though there may be some occasional gaps in bibliographic coupling or historiographic mapping. “Good” DOI indicates

most of the documents have a valid DOI assigned and only a few documents considered for review may lack DOIs which limits full traceability or access. “Acceptable” Corresponding Author imply that a significant portion of the documents either lacks corresponding author information or has been inconsistently formatted which could lead to missing important collaboration patterns or author-specific insights. Acceptable Keywords indicates keyword standardization is weak and thematic clusters may be less accurate and word clouds, trend maps may show fragmented terms. However, we have not seen such fragmented terms in our word clouds and patterns depicted in Figure 4 and Figure 5, however, in Figure 8, two distinct keyword clusters are observed – waste management and females. The cluster around waste management pulls connections with keywords like municipal solid waste, solid waste, recycling, environment, sustainable development, domestic waste, food waste, sustainability, women’s status, sustainability, and decision making whereas the cluster cloud with “female” pulls connection with disposal of waste(women are generally responsible for disposal of waste in a house), occupational exposure, sanitation, hygiene and food. This shows that women are responsible for source segregation. Since they also work as rag pickers and housekeepers, most of the women are exposed to the occupational health hazard. This is also indicative that women are not actively involved in “Waste **Management**”, however they are involved in “waste **disposal**”. Waste management includes all words and treatment methods involved therein in the Waste management cluster.

Figure 8: Correlation between women and waste management word clouds

The cluster is divided into two parts : viz Waste management (recycling, solid waste, education, developing countries, decision making, environmental impact, food waste, women status, sustainability, attitude, environment) and Female (adult, waste disposal, human, controlled study, cross sectional study, occupational exposure, pregnancy, young adult, urban population, agriculture, sanitation, food, male). This shows that there is a correlation between waste management and women.

Poor Keyword plus indicates that the papers cover a highly specific or emerging niche with little overlap in reference titles. If the references do not contain commonly used keywords in their titles, the derived Keywords Plus will be poor. If references are from sources not indexed by Web of Science (e.g., books, local journals), Keywords Plus cannot be generated effectively. The complete absence of the *Science* category in the bibliometric metadata indicates that research on the role of women in waste management is primarily framed through social, environmental, policy, and development lenses rather than core scientific disciplines such as chemistry, biology, or engineering. This indicates that most of the authors who are writing about Solid waste management do not use consistent terms eg. One may refer it to as SWM instead of Solid Waste Management. The issue of Solid waste management is a societal issue and it affects different realms of the society. Therefore, every author may have a different focus and a different keyword eg. One paper discusses role of women in solid waste management from economic point of view whereas another paper discusses what challenges women may have faced during COVID-19 in managing Solid Waste. A correlation mapping of keywords such as *challenges*, *economic status* and *Solid waste* and *COVID-19* is difficult though all of them are pertinent to Solid Waste Management.

Science Category completely missing suggests that the academic focus has largely been on sociological, economic, and gender-related dimensions of waste management—emphasizing community practices, grassroots participation, and gender equity—rather than scientific innovation, material science, or process engineering. It also highlights a potential research gap: the integration of women’s participation within the scientific and technological aspects of waste processing, treatment innovation, and sustainability modelling remains underexplored. Encouraging interdisciplinary research that bridges gender studies and scientific domains could open new avenues for inclusive and effective waste management solutions.

DISCUSSION

United Nations Environment Program (UNEP) has conducted studies on gender equality in waste management in different countries and found that women are always found at the lowest rung of the waste management. Whether it is their home or the profession of picking up waste from the streets, women have representation is more in informal roles and unorganised sector in waste management. As soon as organised roles and a safer environment comes to the foray in waste management, men are found in leadership roles. (UNEP, n.d.)

A report on zero waste model of Ambikapur shows more than 400 women were engaged in changing the condition of Ambikapur from dismal sanitation to a zero waste model. Women were engaged in making bioenzymes at home and selling them through their cooperatives.(Zero Waste Model Ambikapur, Chattisgarh, n.d.) SWaCH initiative of Pune has incorporated a similar model like Stree Mukti Sanghatna and improved the lives of women who are managing waste.(Estrada et al., 2023) Most of the studies that have been conducted have evaluated the role of women in waste management irrespective of their professional responsibilities. A lady can be a teacher but household chores still remain her responsibility including waste management at home. (Mukhter & Chowdhary, 2024). Around the world, women groups managing waste have been more successful is what is evolving giving them a sense of fulfilment and achievement.(Asteria & Herdiansyah, 2022)

It has been observed that when municipal corporations took help of women centric self- help groups for waste management or collaborated with organisations which had women leading the effort for upcycling or waste treatment or recycling of the products, were more successful in implementation of waste management initiatives and clean up of the city than cities which do not have the support of women Self-Help Groups. This can be visualised in Figure 7 in Trend Topics analysis from the database.

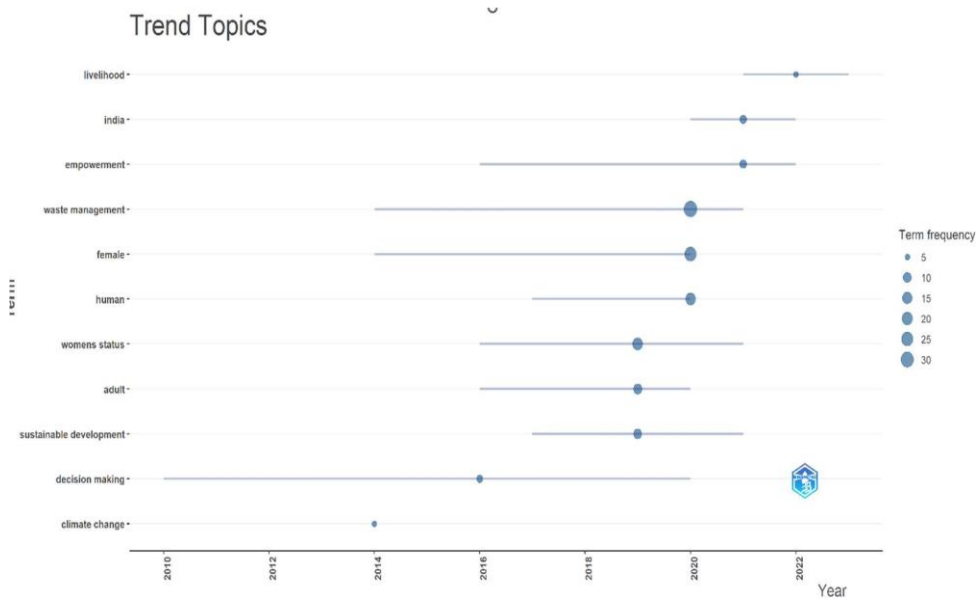


Figure 9: Trend Topics

The trend analysis shows “Climate Change” was first introduced in 2014 with very few mentions. Between 2018 and 2020 discussion was trending towards adult behaviours, sustainable development, women status, female, empowerment, waste management. Most of the waste management was focused on making women empowered by collecting the waste and processing the waste at a cottage industry level. This “empowerment” of women only created small Self Help Groups(Cannon, 2020; Dr. Amrita N Shamanewad et al., 2023; Simon-Kumar, 2025; Tsai et al., 2020). However, no literature is found where a women collective created large business opportunity in “Waste management”. “Business” and “Women” both terms are missing from the word clouds generated and the visual representations generated. We find “women” associated with “disposal of waste” eg. Ragpickers, waste segregators and housekeepers.

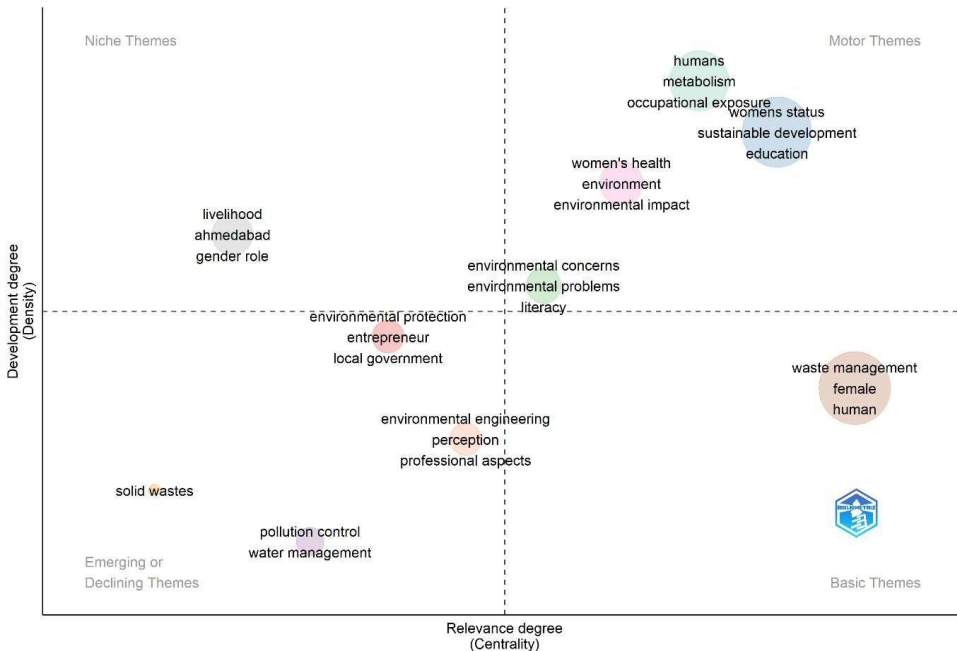


Figure 10: Relevance of Keywords used by authors

The Relevance degree (Centrality) is the importance of the theme in overall study, on X axis. The Y axis shows the cohesiveness of the research within the said theme. The Bubble size is proportionate to the frequency of occurrence of a particular keyword. The Basic theme shows waste management, female and human having a high centrality but low development, implying that these are starting point discussions which are critical for the field but needs more depth and specialization. The motor themes show a High Centrality and high development i.e sustainable development, Education, women's status, Educational concerns Environmental problems, Environmental impact, environment, women's health, Occupational exposure are core well developed themes that are driving current research. These areas are strategic and influential and presents further opportunities for research, collaborations and publications.

The relevance of Keywords used by authors shows that pollution control or waste management, solid wastes are emerging themes as per the Literature review, suggestive of untapped potentialfor research in these fields. Livelihood and gender roles are niche themes with respect to solid waste management.

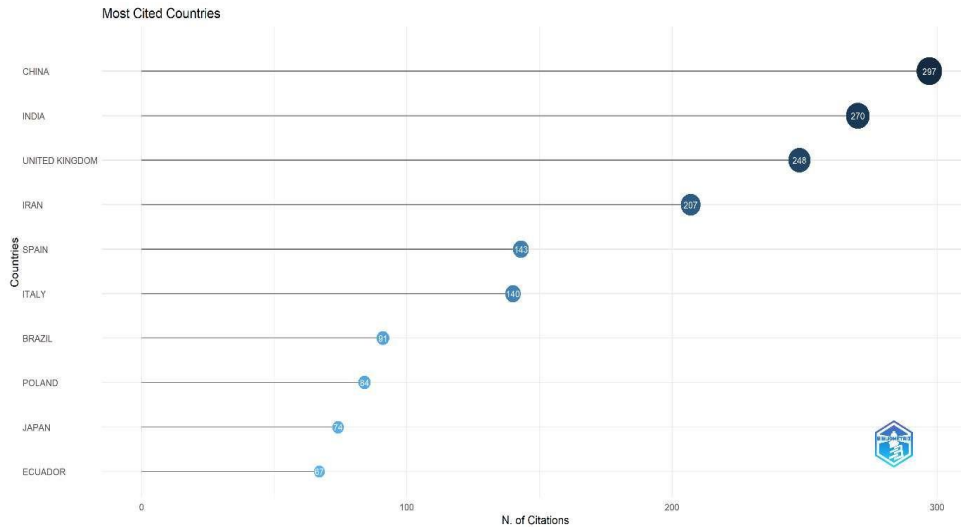


Figure 11: Most Cited Countries

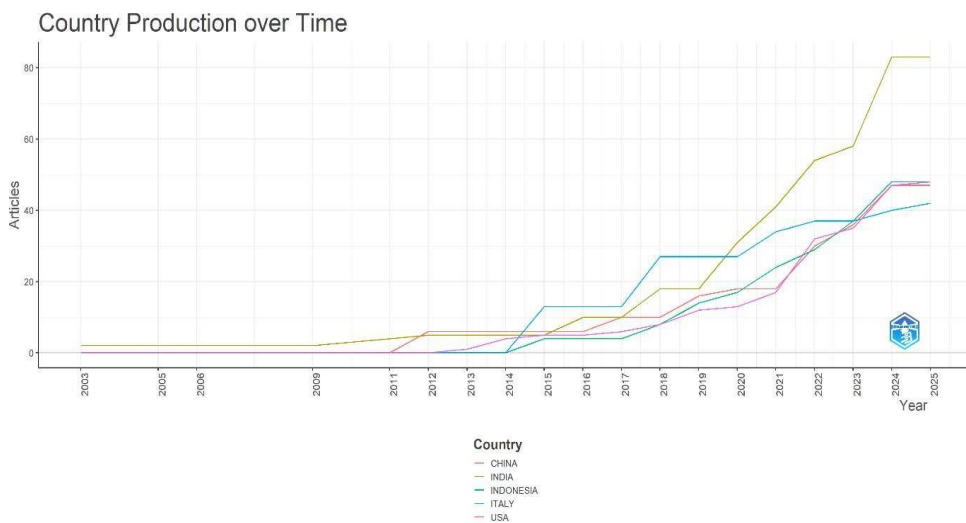


Figure 12: Corresponding Author's countries

The Figure 15 shows the number of research papers produced over a period of time and how the waste issue got traction in the last 25 years. Heavy traction was seen in the last 15 years when landfills started overflowing because of open air dumping, which has been a common practise across continents.

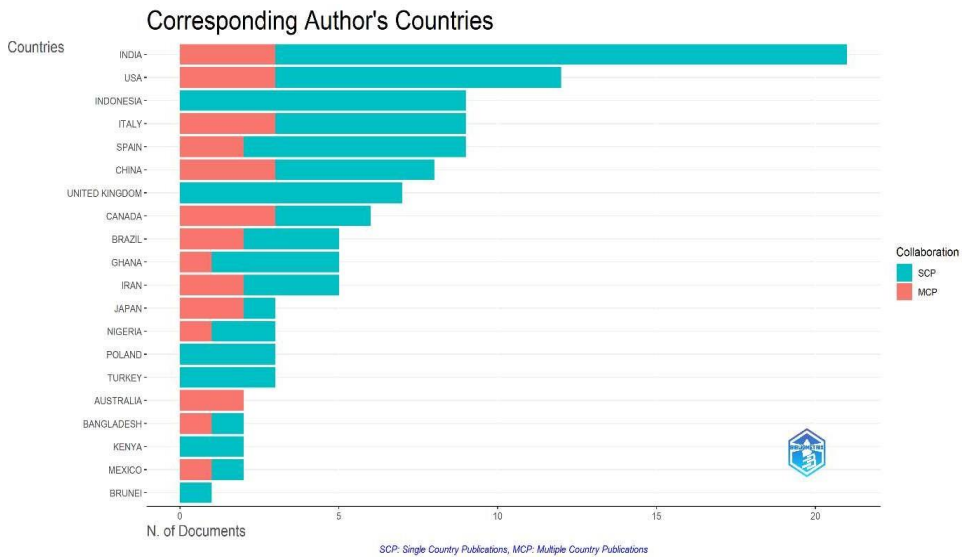


Figure 13: Corresponding Author's Countries

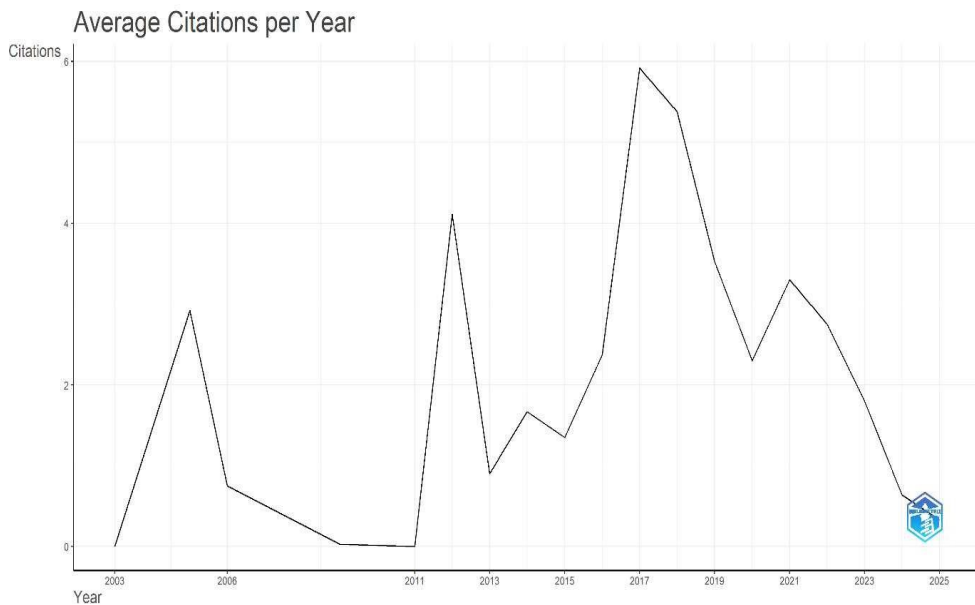


Figure 14: Average Citations Per Year

Average citations per year shows the number of citations that increased during the COVID-19 period and constant work has been going on in the field of research in waste management and role of women for the last fifteen years. The scientific production of work has kept an upward trend.

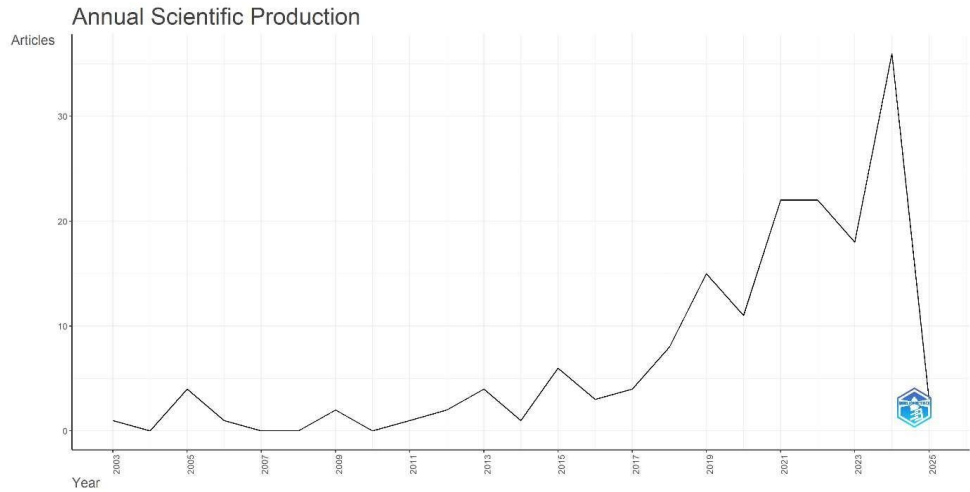


Figure 15: Annual Scientific production

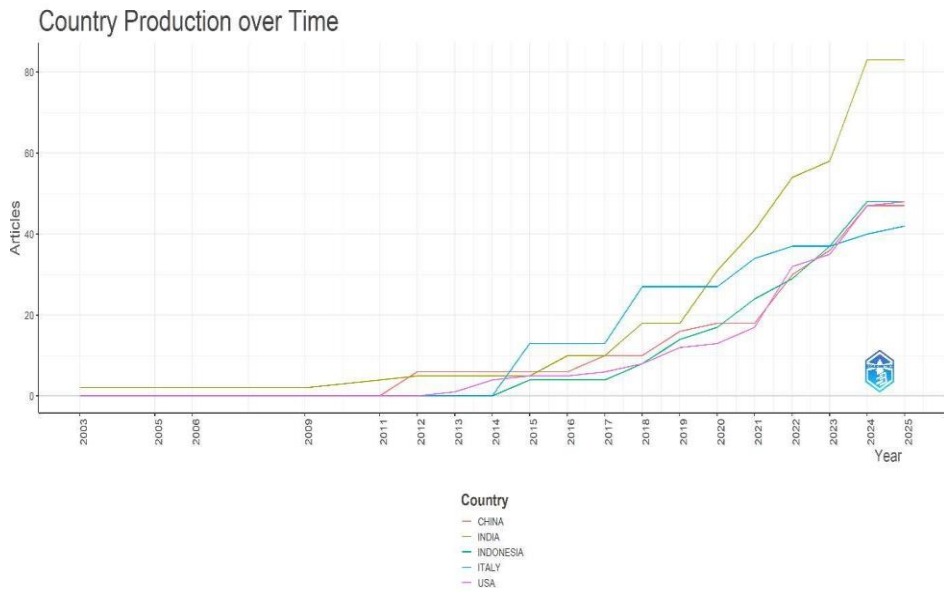


Figure 16: Country Production over time

China and India have strong research and publications in last ten years, showing that these countries are hands on tackling their waste problems through research and improving technology substantiated with research publications. South Asian countries like Indonesia, Japan, Malaysia, Singapore have also done considerable work in the field of Solid Waste Management in the last two decades and these countries are pioneering in waste management treatment and resource recovery.

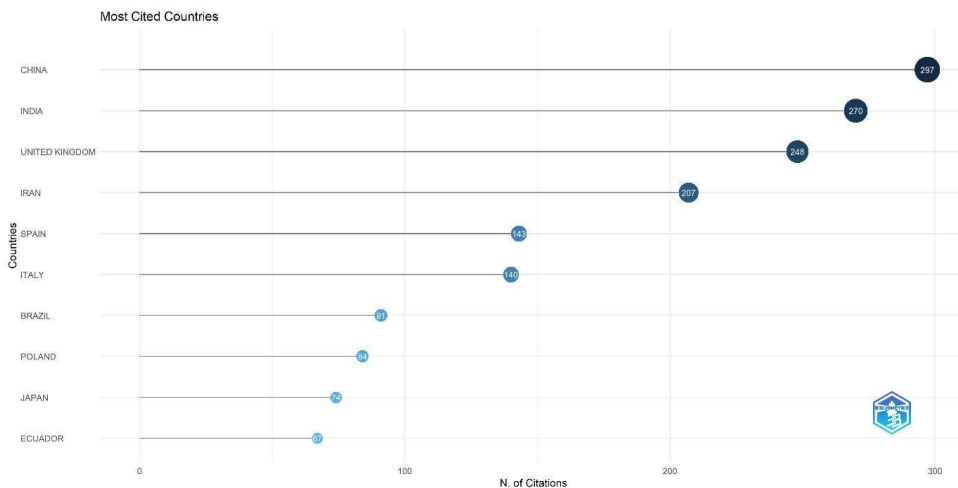


Figure 17: Most Cited Countries

The most cited countries show a trend of developing nations studying their waste and waste characteristics with respect to including women in the role of waste management. Most citations have come from China and India, closely followed by UK, Iran, Spain, Italy, Brazil, Poland, Japan and Ecuador. Most relevant words in the citations have been waste management, female, adult, recycling, waste disposal, article, human, solid waste and male. This shows that though the focus of the topic may be waste management, studies show citations of the “female” though gender biased studies indicate that the women create Self Help Groups, composting solutions, local upcycling, rag pickers self help groups.

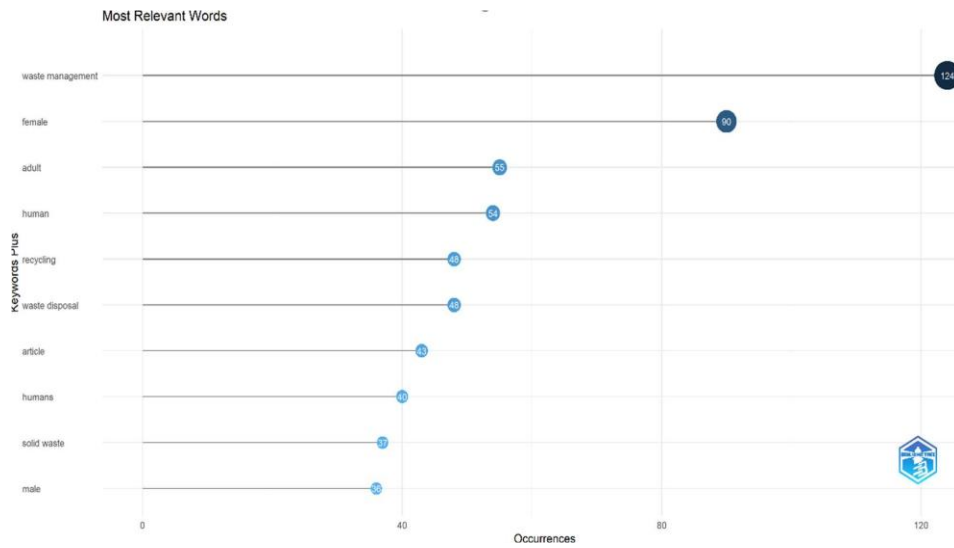


Figure 18: Most relevant words

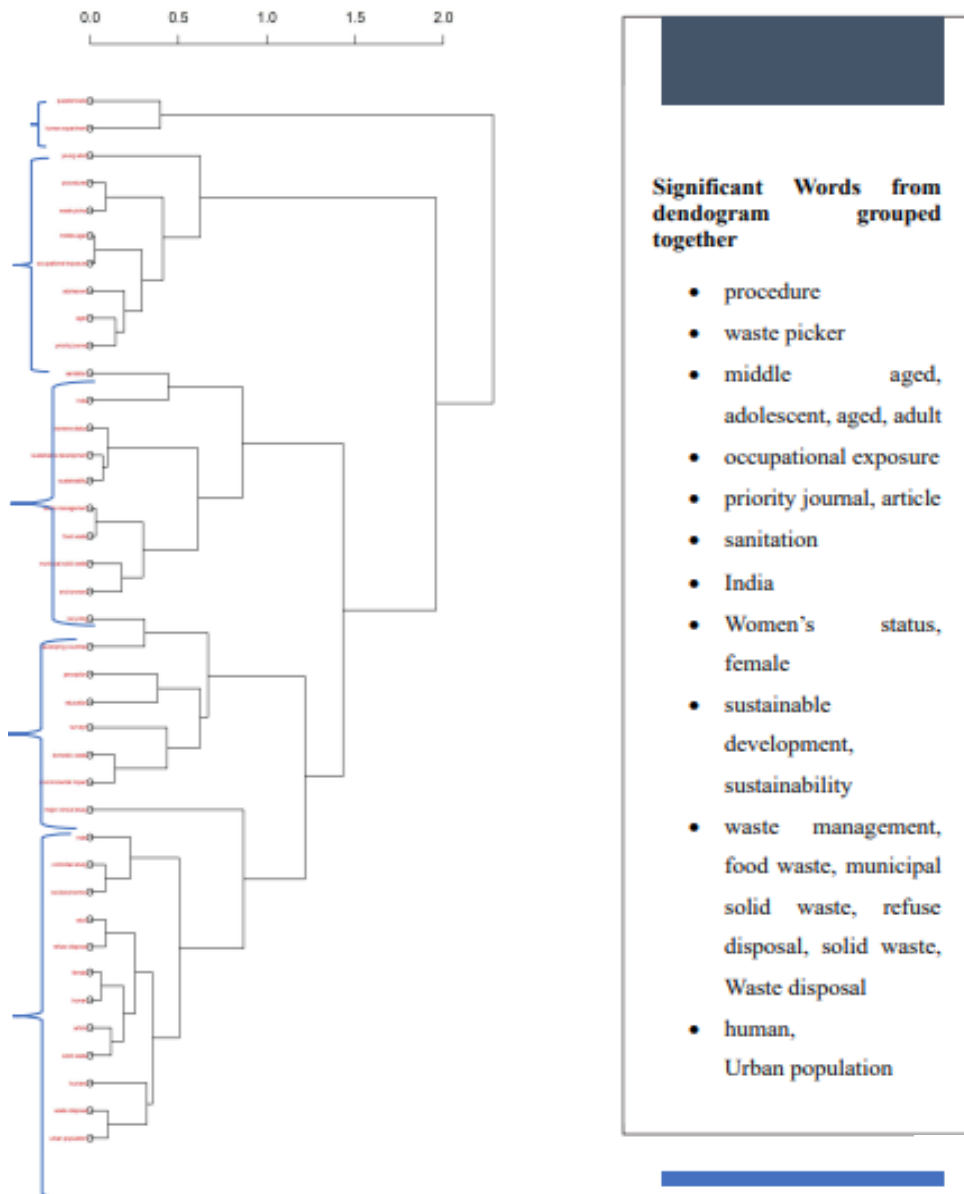


Figure 19: Dendrogram

The above dendrogram shows women directly contribute to waste management in form of ragpickers, urban population, waste management and sustainability. Source segregation improves the efficiency of recycling from households. (Pongpunpurt et al., 2022; Sabki et al., 2019; Tseng et al., 2021) When ragpickers (mostly women) collect the waste and segregate it

correctly, it again improves the recycling efficiency. When waste reaches the recycling facility, women are employed for segregation of waste. Beyond this, we do not see women leading the waste to energy plants, or Biogas plants or CNG plants(Pongpunpurt et al., 2022; Sabki et al., 2019). However, if the waste is mixed and is thrown out of the house, women are considered to be responsible for the same(Simon-Kumar, 2025).

LIMITATIONS OF THE STUDY

This study is limited to Bibliometric analysis of the role of women in leading communities towards efficient waste management. It does not delve into the reasons of the present status of women in the waste management sector nor does it evaluate the effectiveness of the waste management strategies used by different communities.

RECOMMENDATIONS FOR FURTHER RESEARCH

This study leaves a very high potential for further study such as identifying the reasons for women being absent from highly paid roles in waste management sector. Interdisciplinary research that bridges gender studies and scientific domains could open new avenues for inclusive and effective waste management solutions. Effectiveness of waste management strategies used by different communities can be another potential research.

CONCLUSION

Women play an integral part in waste management of a community. This Bibliographic study shows small self help groups can only treat what is recyclable. The problems of mixed waste and other landfill waste needs an industrial solution like waste to energy plants or large gasification systems where small SHGs are not present. A behavioural change can be brought about by SHGs to segregate waste at grassroot level. Recycling and Treatment of waste needs more industrious SHGs with the help of local governance and CSR so that waste treatment and recycling itself can become an Industrial sector led by women.

REFERENCES

- Aria, M., & Cuccurullo, C. (2017). bibliometrix : An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Asteria, D., & Herdiansyah, H. (2022). The role of women in managing waste banks and supporting waste management in local communities. *Community Development Journal*, 57(1), 74–92. <https://doi.org/10.1093/cdj/bsaa025>
- *Beyond an age of waste Turning rubbish into a resource*. (2024). <https://wedocs.unep.org/20.500.11822/44939>
- Cannon, C. (2020). Examining Rural Environmental Injustice: An Analysis of Ruralness, Class, Race, and Gender On the Presence of Landfills Across the United States. *Journal of Rural & Community Development.*, 15(1), 89–114.
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- dos Muchangos, L. S., & Vaughter, P. (2019). Gender Mainstreaming in Waste Education Programs: A Conceptual Framework. *Urban Science*, 3(1), 29. <https://doi.org/10.3390/urbansci3010029>
- Dr. Amrita N Shamanewad, Dr. Priyanka D S, Dr.Renuka Venkatesh, & Ashwini M. (2023). Perception and Practices of Household waste management among residents of an urban area of Karnataka – A cross sectional Study. *European Journal of Cardiovascular Medicine*, 13(3). www.healthcare-bulletin.co.uk
- Estrada, M., Galvin, M., Maassen, A., & Hörschelmann, K. (2023). Catalysing urban transformation through women’s empowerment in cooperative waste management: the SWaCH initiative in Pune, India. *Local Environment*, 28(7), 852–866. <https://doi.org/10.1080/13549839.2022.2090532>
- Goldberg, M. S., Siemiatyck, J., Dewar, R., Désy, M., & Riberdy, H. (1999). Risks of Developing Cancer Relative to Living near a Municipal Solid Waste Landfill Site in Montreal, Quebec, Canada. *Archives of Environmental Health: An International Journal*, 54(4), 291–296. <https://doi.org/10.1080/00039899909602488>

- Heitor, M. (2015). How university global partnerships may facilitate a new era of international affairs and foster political and economic relations. *Technological Forecasting and Social Change*, 95, 276–293. <https://doi.org/10.1016/j.techfore.2015.01.005>
- Linzner, R., & Lange, U. (2013). Role and size of informal sector in waste management – a review. *Proceedings of the Institution of Civil Engineers - Waste and Resource Management*, 166(2), 69–83. <https://doi.org/10.1680/warm.12.00012>
- Mengist, W., Soromessa, T., & Legese, G. (2020). Method for conducting systematic literature review and meta-analysis for environmental science research. *MethodsX*, 7, 100777. <https://doi.org/10.1016/j.mex.2019.100777>
- Morrissey, A. J., & Browne, J. (2004). Waste management models and their application to sustainable waste management. *Waste Management*, 24(3), 297–308. <https://doi.org/10.1016/j.wasman.2003.09.005>
- Mukhter, I., & Chowdhary, R. (2024). What rural women say about their role in household waste management in Kashmir? A case-series approach. In *Local Environment* (Vol. 29, Issue 9, pp. 1129–1134). Routledge. <https://doi.org/10.1080/13549839.2023.2284937>
- National Green Tribunal. (2016). *Corrected Judgment Before The National Green Tribunal Principal Bench New Delhi. Original Application*
- NO. 199 OF 2014. <https://www.almitrapatel.com/docs/NGT-Directions-in-OA-199-of-2014.pdf>
- Paul, K., Chattopadhyay, S., Dutta, A., Krishna, A. P., & Ray, S. (2020). Developing And Optimising An Urban Integrated Solid Waste Management Model:
- Effect of Transfer Stations. *Journal of Urban and Environmental Engineering*, 119–131. <https://doi.org/10.4090/juee.2020.v14n1.119-131>
- Pongpunpurt, P., Muensitthiroj, P., Pinitjitsamut, P., Chuenchum, P., Painmanakul, P., Chawaloephonsiya, N., & Poyai, T. (2022). Studying Waste Separation Behaviors and Environmental Impacts toward Sustainable Solid Waste Management: A Case Study of Bang Chalong Housing, Samut Prakan, Thailand. *Sustainability*, 14(9), 5040. <https://doi.org/10.3390/su14095040>
- Sabki, M. H., Lee, C. T., Bong, C. P. C., Zhang, Z., Li, C., & Klemeš, J. J. (2019). Sustainable organic waste management framework: A case

study in Minhang district, Shanghai, China. *Chemical Engineering Transactions*, 72, 7–12. <https://doi.org/10.3303/CET1972002>

- Sasha R. (n.d.). *Six women-led organisations tackling India's garbage crisis with impactful solutions* Read more at: <https://yourstory.com/herstory/2019/04/women-tackling-india-garbage-crisis>. YourStory.Com.
- Simon-Kumar, R. (2025). Women, consumption and the environment: conflicting accounts of gender in sustainability practices in urban Kerala, India. *Gender, Place & Culture*, 1–27. <https://doi.org/10.1080/0966369X.2025.2474578>
- Sweetey, J. B. S. P. K. c, d, Mahmud, A., Mahmud, I., & Hossain, A. (n.d.). *SOLID WASTE SEPARATION AMONG WOMEN IN DHAKA HOUSEHOLDS: AN EXTENDED TPB PERSPECTIVE*.
- Tsai, F. M., Bui, T.-D., Tseng, M.-L., & Wu, K.-J. (2020). A causal municipal solid waste management model for sustainable cities in Vietnam under uncertainty: A comparison. *Resources, Conservation and Recycling*, 154, 104599. <https://doi.org/10.1016/j.resconrec.2019.104599>
- Tseng, M.-L., Bui, T.-D., & Lim, M. K. (2021). Resource utilization model for sustainable solid waste management in Vietnam: A crisis response hierarchical structure *Resources, Conservation and Recycling*, 171, 105632. <https://doi.org/10.1016/j.resconrec.2021.105632>
- Turner, M. C., Andersen, Z. J., Baccarelli, A., Diver, W. R., Gapstur, S. M., Pope, C. A., Prada, D., Samet, J., Thurston, G., & Cohen, A. (2020). Outdoor air pollution and cancer: An overview of the current evidence and public health recommendations. *CA: A Cancer Journal for Clinicians*, 70(6), 460–479. <https://doi.org/10.3322/caac.21632>
- UNEP. (n.d.). *When waste works for women*.
- van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538. <https://doi.org/10.1007/s11192-009-0146-3>
- *Wastewor(l)d Social Entitlements for Waste Pickers Social Entitlements for Waste Pickers*. (n.d.).
- *Wasting women—the biopolitics of waste and women*. (n.d.).
- *Zero Waste Model Ambikapur, Chattisgarh*. (n.d.).